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(21) International Application Number: PCT/US99/30909 (22) International Filing Date: 23 December 1999 (23.12.99) (30) Priority Data: 09/221,298 23 December 1998 (23.12.98) US 09/347,496 2 July 1999 (02.07.99) US 09/401,064 22 September 1999 (22.09.99) US 09/444,242 19 November 1999 (19.11.99) US 09/454,150 2 December 1999 (02.12.99) US (71) Applicant (for all designated States except US): CORIXA CORPORATION [US/US]; Suite 200, 1124 Columbia Street, Seattle, WA 98104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): XU, Jiangchun [US/US]; 15805 SE 43rd Place, Bellevue, WA 98006 (US). LODES, Michael, J. [US/US]; 9223 - 36th Avenue SW, Seattle, WA 98126 (US). SECRIST, Heather [US/US]; 3844 - 35th Avenue West, Seattle, WA 98199 (US). BENSON, Darin, R. [US/US]; 723 N. 48th Street, Seattle, WA 98104 (US). MEAGHER, Madeleine, Joy [US/US]; 3819 Interlake Avenue N., Seattle, WA 98103 (US). STOLK, John [US/US]; 7436 NE 144th Place, Bothell, WA 98011		(US). WANG, Tongtong [CN/US]; 8049 NE 28th Street, Medina, WA 98039 (US). YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). (74) Agents: MAKI, David, J. et al.; Seed and Berry LLP, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published Without international search report and to be republished upon receipt of that report.	
(54) Title: COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE			
(57) Abstract Compositions and methods for the therapy and diagnosis of cancer, such as colon cancer, are disclosed. Compositions may comprise one or more colon tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a colon tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as colon cancer. Diagnostic methods based on detecting a colon tumor protein, or mRNA encoding such a protein, in a sample are also provided.			

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COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

5 The present invention relates generally to therapy and diagnosis of cancer, such as colon cancer. The invention is more specifically related to polypeptides comprising at least a portion of a colon tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of colon cancer, and for the
10 diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

 Cancer is a significant health problem throughout the world. Although advances have been made in detection and therapy of cancer, no vaccine or other universally successful method for prevention or treatment is currently available. Current therapies, which
15 are generally based on a combination of chemotherapy or surgery and radiation, continue to prove inadequate in many patients.

 Colon cancer is the second most frequently diagnosed malignancy in the United States as well as the second most common cause of cancer death. An estimated 95,600 new cases of colon cancer will be diagnosed in 1998, with an estimated 47,700 deaths.
20 The five-year survival rate for patients with colorectal cancer detected in an early localized stage is 92%; unfortunately, only 37% of colorectal cancer is diagnosed at this stage. The survival rate drops to 64% if the cancer is allowed to spread to adjacent organs or lymph nodes, and to 7% in patients with distant metastases.

 The prognosis of colon cancer is directly related to the degree of penetration of
25 the tumor through the bowel wall and the presence or absence of nodal involvement, consequently, early detection and treatment are especially important. Currently, diagnosis is aided by the use of screening assays for fecal occult blood, sigmoidoscopy, colonoscopy and double contrast barium enemas. Treatment regimens are determined by the type and stage of the cancer, and include surgery, radiation therapy and/or chemotherapy. Recurrence
30 following surgery (the most common form of therapy) is a major problem and is often the

ultimate cause of death. In spite of considerable research into therapies for the disease, colon cancer remains difficult to diagnose and treat. In spite of considerable research into therapies for these and other cancers, colon cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the diagnosis and therapy of cancer, such as colon cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a colon tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises a sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in SEQ ID NO: 1-121, 123-197 and 205-486; (b) variants of a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486; and (c) complements of a sequence of (a) or (b).

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a colon tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a colon tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

5 Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

10 Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an
15 immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for
20 removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of
25 a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a
30 polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under

conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective
5 amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a colon tumor protein; (ii) a polynucleotide encoding such a
10 polypeptide; and (iii) an antigen-presenting cell that expresses such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining
15 the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred
20 embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be colon cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding
25 agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

30 The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a)

contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached figures. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

SEQUENCE IDENTIFIERS

SEQ ID NO: 1 is a first determined cDNA sequence for Contig 1, showing homology to Neutrophil Gelatinase Associated Lipocalin.

SEQ ID NO: 2 is the determined cDNA sequence for Contig 2, showing no significant homology to any known genes.

SEQ ID NO: 3 is the determined cDNA sequence for Contig 4, showing homology to Carcinoembryonic antigen.

5 SEQ ID NO: 4 is the determined cDNA sequence for Contig 5, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 5 is the determined cDNA sequence for Contig 9, showing homology to Carcinoembryonic antigen.

10 SEQ ID NO: 6 is the determined cDNA sequence for Contig 52, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 7 is the determined cDNA sequence for Contig 6, showing homology to Villin.

SEQ ID NO: 8 is the determined cDNA sequence for Contig 8, showing no significant homology to any known genes.

15 SEQ ID NO: 9 is the determined cDNA sequence for Contig 10, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 10 is the determined cDNA sequence for Contig 19, showing homology to Transforming Growth Factor (BIGH3).

20 SEQ ID NO: 11 is the determined cDNA sequence for Contig 21, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 12 is the determined cDNA sequence for Contig 11, showing homology to CO-029.

SEQ ID NO: 13 is the determined cDNA sequence for Contig 55, showing homology to CO-029.

25 SEQ ID NO: 14 is the determined cDNA sequence for Contig 12, showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P.

SEQ ID NO: 15 is the determined cDNA sequence for Contig 13, showing no significant homology to any known gene.

30 SEQ ID NO: 16 is the determined cDNA sequence for Contig 14, also referred to as 14261, showing no significant homology to any known gene.

SEQ ID NO: 17 is the determined cDNA sequence for Contig 15, showing homology to Ets-Related Transcription Factor (ERT).

SEQ ID NO: 18 is the determined cDNA sequence for Contig 16, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

5 SEQ ID NO: 19 is the determined cDNA sequence for Contig 24, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

SEQ ID NO: 20 is the determined cDNA sequence for Contig 17, showing homology to Cytokeratin.

10 SEQ ID NO: 21 is the determined cDNA sequence for Contig 18, showing homology to L1-Cadherin.

SEQ ID NO: 22 is the determined cDNA sequence for Contig 20, showing no significant homology to any known gene.

SEQ ID NO: 23 is the determined cDNA sequence for Contig 22, showing homology to Bumetanide-sensitive Na-K-Cl cotransporter (NKCC1).

15 SEQ ID NO: 24 is the determined cDNA sequence for Contig 23, showing no significant homology to any known gene.

SEQ ID NO: 25 is the determined cDNA sequence for Contig 25, showing homology to Macrophage Inflammatory Protein 3 alpha.

20 SEQ ID NO: 26 is the determined cDNA sequence for Contig 26, showing homology to Laminin.

SEQ ID NO: 27 is the determined cDNA sequence for Contig 48, showing homology to Laminin.

SEQ ID NO: 28 is the determined cDNA sequence for Contig 27, showing homology to Mytobularin (MTM1).

25 SEQ ID NO: 29 is the determined cDNA sequence for Contig 28, showing homology to Chromosome 16 BAC clone CIT987SK-A-363E6.

SEQ ID NO: 30 is the determined cDNA sequence for Contig 29, also referred to as C751P and 14247, showing no significant homology to any known gene, but partial homology to Rat GSK-3 β -interacting protein Axil homolog.

30 SEQ ID NO: 31 is the determined cDNA sequence for Contig 30, showing homology to Zinc Finger Transcription Factor (ZNF207).

SEQ ID NO: 32 is the determined cDNA sequence for Contig 31, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

5 SEQ ID NO: 33 is the determined cDNA sequence for Contig 35, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

SEQ ID NO: 34 is the determined cDNA sequence for Contig 32, showing no significant homology to any known gene.

10 SEQ ID NO: 35 is the determined cDNA sequence for Contig 34, showing homology to Desmoglein 2.

SEQ ID NO: 36 is the determined cDNA sequence for Contig 36, showing no significant homology to any known gene.

SEQ ID NO: 37 is the determined cDNA sequence for Contig 37, showing homology to Putative Transmembrane Protein.

15 SEQ ID NO: 38 is the determined cDNA sequence for Contig 38, also referred to as C796P and 14219, showing no significant homology to any known gene.

SEQ ID NO: 39 is the determined cDNA sequence for Contig 40, showing homology to Nonspecific Cross-reacting Antigen.

20 SEQ ID NO: 40 is the determined cDNA sequence for Contig 41, also referred to as C799P and 14308, showing no significant homology to any known gene.

SEQ ID NO: 41 is the determined cDNA sequence for Contig 42, also referred to as C794P and 14309, showing no significant homology to any known gene.

SEQ ID NO: 42 is the determined cDNA sequence for Contig 43, showing homology to Chromosome 1 specific transcript KIAA0487.

25 SEQ ID NO: 43 is the determined cDNA sequence for Contig 45, showing homology to hMCM2.

SEQ ID NO: 44 is the determined cDNA sequence for Contig 46, showing homology to ETS2.

30 SEQ ID NO: 45 is the determined cDNA sequence for Contig 49, showing homology to Pump-1.

SEQ ID NO: 46 is the determined cDNA sequence for Contig 50, also referred to as C792P and 18323, showing no significant homology to any known gene.

SEQ ID NO: 47 is the determined cDNA sequence for Contig 51, also referred to as C795P and 14317, showing no significant homology to any known gene.

5 SEQ ID NO: 48 is the determined cDNA sequence for 11092, showing no significant homology to any known gene.

SEQ ID NO: 49 is the determined cDNA sequence for 11093, showing no significant homology to any known gene.

10 SEQ ID NO: 50 is the determined cDNA sequence for 11094, showing homology to Human Putative Enterocyte Differentiation Protein.

SEQ ID NO: 51 is the determined cDNA sequence for 11095, showing homology to Human Transcriptional Corepressor hKAP1/TIF1B mRNA.

SEQ ID NO: 52 is the determined cDNA sequence for 11096, showing no significant homology to any known gene.

15 SEQ ID NO: 53 is the determined cDNA sequence for 11097, showing homology to Human Nonspecific Antigen.

SEQ ID NO: 54 is the determined cDNA sequence for 11098, showing no significant homology to any known gene.

20 SEQ ID NO: 55 is the determined cDNA sequence for 11099, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 56 is the determined cDNA sequence for 11186, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 57 is the determined cDNA sequence for 11101, showing homology to Human Chromosome X.

25 SEQ ID NO: 58 is the determined cDNA sequence for 11102, showing homology to Human Chromosome X.

SEQ ID NO: 59 is the determined cDNA sequence for 11103, showing no significant homology to any known gene.

30 SEQ ID NO: 60 is the determined cDNA sequence for 11174, showing no significant homology to any known gene.

SEQ ID NO: 61 is the determined cDNA sequence for 11104, showing homology to Human mRNA for KIAA0154.

SEQ ID NO: 62 is the determined cDNA sequence for 11105, showing homology to Human Apurinic/Apyrimidinic Endonuclease (hap1)mRNA.

5 SEQ ID NO: 63 is the determined cDNA sequence for 11106, showing homology to Human Chromosome 12p13.

SEQ ID NO: 64 is the determined cDNA sequence for 11107, showing homology to Human 90 kDa Heat Shock Protein.

10 SEQ ID NO: 65 is the determined cDNA sequence for 11108, showing no significant homology to any known gene.

SEQ ID NO: 66 is the determined cDNA sequence for 11112, showing no significant homology to any known gene.

SEQ ID NO: 67 is the determined cDNA sequence for 11115, showing no significant homology to any known gene.

15 SEQ ID NO: 68 is the determined cDNA sequence for 11117, showing no significant homology to any known gene.

SEQ ID NO: 69 is the determined cDNA sequence for 11118, showing no significant homology to any known gene.

20 SEQ ID NO: 70 is the determined cDNA sequence for 11119, showing homology to Human Elongation Factor 1-alpha.

SEQ ID NO: 71 is the determined cDNA sequence for 11121, showing homology to Human Lamin B Receptor (LBR) mRNA.

SEQ ID NO: 72 is the determined cDNA sequence for 11122, showing homology to H. sapiens mRNA for Novel Glucocorticoid.

25 SEQ ID NO: 73 is the determined cDNA sequence for 11123, showing homology to H. sapiens mRNA for snRNP protein B.

SEQ ID NO: 74 is the determined cDNA sequence for 11124, showing homology to Human Cisplatin Resistance Associated Beta-protein.

30 SEQ ID NO: 75 is the determined cDNA sequence for 11127, showing homology to M. musculus Calumenin mRNA.

SEQ ID NO: 76 is the determined cDNA sequence for 11128, showing homology to Human ras-related small GTP binding protein.

SEQ ID NO: 77 is the determined cDNA sequence for 11130, showing homology to Human Cosmid U169d2.

5 SEQ ID NO: 78 is the determined cDNA sequence for 11131, showing homology to H. sapiens mRNA for protein homologous to Elongation 1-g.

SEQ ID NO: 79 is the determined cDNA sequence for 11134, showing no significant homology to any known gene.

10 SEQ ID NO: 80 is the determined cDNA sequence for 11135, showing homology to H. sapiens Nieman-Pick (NPC1) mRNA.

SEQ ID NO: 81 is the determined cDNA sequence for 11137, showing homology to H. sapiens mRNA for Niecin b-chain.

SEQ ID NO: 82 is the determined cDNA sequence for 11138, showing homology to Human Endogenous Retroviral Protease mRNA.

15 SEQ ID NO: 83 is the determined cDNA sequence for 11139, showing homology to H. sapiens mRNA for DMBT1 protein.

SEQ ID NO: 84 is the determined cDNA sequence for 11140, showing homology to H. sapiens ras GTPase activating-like protein.

20 SEQ ID NO: 85 is the determined cDNA sequence for 11143, showing homology to Human Acidic Ribosomal Phosphoprotein PO mRNA.

SEQ ID NO: 86 is the determined cDNA sequence for 11144, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 87 is the determined cDNA sequence for 11145, showing homology to Human GTP-binding protein.

25 SEQ ID NO: 88 is the determined cDNA sequence for 11148, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 89 is the determined cDNA sequence for 11151, showing no significant homology to any known gene.

30 SEQ ID NO: 90 is the determined cDNA sequence for 11154, showing no significant homology to any known gene.

SEQ ID NO: 91 is the determined cDNA sequence for 11156, showing homology to H. sapiens Ribosomal Protein L27.

SEQ ID NO: 92 is the determined cDNA sequence for 11157, showing homology to H. sapiens Ribosomal Protein L27.

5 SEQ ID NO: 93 is the determined cDNA sequence for 11158, showing no significant homology to any known gene.

SEQ ID NO: 94 is the determined cDNA sequence for 11162, showing homology to Ag-X antigen.

10 SEQ ID NO: 95 is the determined cDNA sequence for 11164, showing homology to H. sapiens mRNA for Signal Recognition Protein sub14.

SEQ ID NO: 96 is the determined cDNA sequence for 11165, showing homology to Human PAC 204e5/127h14.

SEQ ID NO: 97 is the determined cDNA sequence for 11166, showing homology to Human mRNA for KIAA0108.

15 SEQ ID NO: 98 is the determined cDNA sequence for 11167, showing homology to H. sapiens mRNA for Neutrophil Gelatinase asst. Lipocalin.

SEQ ID NO: 99 is the determined cDNA sequence for 11168, showing no significant homology to any known gene.

20 SEQ ID NO: 100 is the determined cDNA sequence for 11172, showing no significant homology to any known gene.

SEQ ID NO: 101 is the determined cDNA sequence for 11175, showing no significant homology to any known gene.

SEQ ID NO: 102 is the determined cDNA sequence for 11176, showing homology to Human maspin mRNA.

25 SEQ ID NO: 103 is the determined cDNA sequence for 11177, showing homology to Human Carcinoembryonic Antigen.

SEQ ID NO: 104 is the determined cDNA sequence for 11178, showing homology to Human A-Tubulin mRNA.

30 SEQ ID NO: 105 is the determined cDNA sequence for 11179, showing homology to Human mRNA for proton-ATPase-like protein.

SEQ ID NO: 106 is the determined cDNA sequence for 11180, showing homology to Human HepG2 3' region cDNA clone hmd.

SEQ ID NO: 107 is the determined cDNA sequence for 11182, showing homology to Human MHC homologous to Chicken B-Complex Protein.

5 SEQ ID NO: 108 is the determined cDNA sequence for 11183, showing homology to Human High Mobility Group Box (SSRP1) mRNA.

SEQ ID NO: 109 is the determined cDNA sequence for 11184, showing no significant homology to any known gene.

10 SEQ ID NO: 110 is the determined cDNA sequence for 11185, showing no significant homology to any known gene.

SEQ ID NO: 111 is the determined cDNA sequence for 11187, showing no significant homology to any known gene.

SEQ ID NO: 112 is the determined cDNA sequence for 11190, showing homology to Human Replication Protein A 70kDa.

15 SEQ ID NO: 113 is the determined cDNA sequence for Contig 47, also referred to as C797P, showing homology to Human Chromosome X clone bW XD342.

SEQ ID NO: 114 is the determined cDNA sequence for Contig 7, showing homology to Equilibrative Nucleoside Transporter 2 (ent2).

20 SEQ ID NO: 115 is the determined cDNA sequence for 14235.1, also referred to as C791P, showing homology to H. sapiens chromosome 21 derived BAC containing ets-2 gene.

SEQ ID NO: 116 is the determined cDNA sequence for 14287.2, showing no significant homology to any known gene, but some degree of homology to Putative Transmembrane Protein.

25 SEQ ID NO: 117 is the determined cDNA sequence for 14233.1, also referred to as Contig 48, showing no significant homology to any known gene.

SEQ ID NO: 118 is the determined cDNA sequence for 14298.2, also referred to as C793P, showing no significant homology to any known gene.

30 SEQ ID NO: 119 is the determined cDNA sequence for 14372, also referred to as Contig 44, showing no significant homology to any known gene.

SEQ ID NO: 120 is the determined cDNA sequence for 14295, showing homology to secreted cement gland protein XAG-2 homolog.

SEQ ID NO: 121 is the determined full-length cDNA sequence for a clone showing homology to Beta IG-H3.

5 SEQ ID NO: 122 is the predicted amino acid sequence for the clone of SEQ ID NO: 121.

SEQ ID NO: 123 is a longer determined cDNA sequence for C751P.

SEQ ID NO: 124 is a longer determined cDNA sequence for C791P.

SEQ ID NO: 125 is a longer determined cDNA sequence for C792P.

10 SEQ ID NO: 126 is a longer determined cDNA sequence for C793P.

SEQ ID NO: 127 is a longer determined cDNA sequence for C794P.

SEQ ID NO: 128 is a longer determined cDNA sequence for C795P.

SEQ ID NO: 129 is a longer determined cDNA sequence for C796P.

SEQ ID NO: 130 is a longer determined cDNA sequence for C797P.

15 SEQ ID NO: 131 is a longer determined cDNA sequence for C798P.

SEQ ID NO: 132 is a longer determined cDNA sequence for C799P.

SEQ ID NO: 133 is a first partial determined cDNA sequence for CoSub-3 (also known as 23569).

20 SEQ ID NO: 134 is a second partial determined cDNA sequence for CoSub-3 (also known as 23569).

SEQ ID NO: 135 is a first partial determined cDNA sequence for CoSub-13 (also known as 23579).

SEQ ID NO: 136 is a second partial determined cDNA sequence for CoSub-13 (also known as 23579).

25 SEQ ID NO: 137 is the determined cDNA sequence for CoSub-17 (also known as 23583).

SEQ ID NO: 138 is the determined cDNA sequence for CoSub-19 (also known as 23585).

30 SEQ ID NO: 139 is the determined cDNA sequence for CoSub-22 (also known as 23714).

SEQ ID NO: 140 is the determined cDNA sequence for CoSub-23 (also known as 23715).

SEQ ID NO: 141 is the determined cDNA sequence for CoSub-26 (also known as 23717).

5 SEQ ID NO: 142 is the determined cDNA sequence for CoSub-33 (also known as 23724).

SEQ ID NO: 143 is the determined cDNA sequence for CoSub-34 (also known as 23725).

10 SEQ ID NO: 144 is the determined cDNA sequence for CoSub-35 (also known as 23726).

SEQ ID NO: 145 is the determined cDNA sequence for CoSub-37 (also known as 23728).

SEQ ID NO: 146 is the determined cDNA sequence for CoSub-39 (also known as 23730).

15 SEQ ID NO: 147 is the determined cDNA sequence for CoSub-42 (also known as 23766).

SEQ ID NO: 148 is the determined cDNA sequence for CoSub-44 (also known as 23768).

20 SEQ ID NO: 149 is the determined cDNA sequence for CoSub-47 (also known as 23771).

SEQ ID NO: 150 is the determined cDNA sequence for CoSub-54 (also known as 23778).

SEQ ID NO: 151 is the determined cDNA sequence for CoSub-55 (also known as 23779).

25 SEQ ID NO: 152 is the determined cDNA sequence for CT1 (also known as 24099).

SEQ ID NO: 153 is the determined cDNA sequence for CT2 (also known as 24100).

SEQ ID NO: 154 is the determined cDNA sequence for CT3 (also known as 24101).

SEQ ID NO: 155 is the determined cDNA sequence for CT6 (also known as 24104).

SEQ ID NO: 156 is the determined cDNA sequence for CT7 (also known as 24105).

30 SEQ ID NO: 157 is the determined cDNA sequence for CT12 (also known as 24110).

SEQ ID NO: 158 is the determined cDNA sequence for CT13 (also known as 24111).

SEQ ID NO: 159 is the determined cDNA sequence for CT14 (also known as 24112).
SEQ ID NO: 160 is the determined cDNA sequence for CT15 (also known as 24113).
SEQ ID NO: 161 is the determined cDNA sequence for CT17 (also known as 24115).
SEQ ID NO: 162 is the determined cDNA sequence for CT18 (also known as 24116).
5 SEQ ID NO: 163 is the determined cDNA sequence for CT22 (also known as 23848).
SEQ ID NO: 164 is the determined cDNA sequence for CT24 (also known as 23849).
SEQ ID NO: 165 is the determined cDNA sequence for CT31 (also known as 23854).
SEQ ID NO: 166 is the determined cDNA sequence for CT34 (also known as 23856).
SEQ ID NO: 167 is the determined cDNA sequence for CT37 (also known as 23859).
10 SEQ ID NO: 168 is the determined cDNA sequence for CT39 (also known as 23860).
SEQ ID NO: 169 is the determined cDNA sequence for CT40 (also known as 23861).
SEQ ID NO: 170 is the determined cDNA sequence for CT51 (also known as 24130).
SEQ ID NO: 171 is the determined cDNA sequence for CT53 (also known as 24132).
SEQ ID NO: 172 is the determined cDNA sequence for CT63 (also known as 24595).
15 SEQ ID NO: 173 is the determined cDNA sequence for CT88 (also known as 24608).
SEQ ID NO: 174 is the determined cDNA sequence for CT92 (also known as 24800).
SEQ ID NO: 175 is the determined cDNA sequence for CT94 (also known as 24802).
SEQ ID NO: 176 is the determined cDNA sequence for CT102 (also known as
24805).
20 SEQ ID NO: 177 is the determined cDNA sequence for CT103 (also known as
24806).
SEQ ID NO: 178 is the determined cDNA sequence for CT111 (also known as
25520).
SEQ ID NO: 179 is the determined cDNA sequence for CT118 (also known as
25 25522).
SEQ ID NO: 180 is the determined cDNA sequence for CT121 (also known as
25523).
SEQ ID NO: 181 is the determined cDNA sequence for CT126 (also known as
25527).
30 SEQ ID NO: 182 is the determined cDNA sequence for CT135 (also known as
25534).

SEQ ID NO: 183 is the determined cDNA sequence for CT140 (also known as 25537).

SEQ ID NO: 184 is the determined cDNA sequence for CT145 (also known as 25542).

5 SEQ ID NO: 185 is the determined cDNA sequence for CT147 (also known as 25543).

SEQ ID NO: 186 is the determined cDNA sequence for CT148 (also known as 25544).

10 SEQ ID NO: 187 is the determined cDNA sequence for CT502 (also known as 26420).

SEQ ID NO: 188 is the determined cDNA sequence for CT507 (also known as 26425).

SEQ ID NO: 189 is the determined cDNA sequence for CT521 (also known as 27366).

15 SEQ ID NO: 190 is the determined cDNA sequence for CT544 (also known as 27375).

SEQ ID NO: 191 is the determined cDNA sequence for CT577 (also known as 27385).

20 SEQ ID NO: 192 is the determined cDNA sequence for CT580 (also known as 27387).

SEQ ID NO: 193 is the determined cDNA sequence for CT594 (also known as 27540).

SEQ ID NO: 194 is the determined cDNA sequence for CT606 (also known as 27547).

25 SEQ ID NO: 195 is the determined cDNA sequence for CT607 (also known as 27548).

SEQ ID NO: 196 is the determined cDNA sequence for CT599 (also known as 27903).

30 SEQ ID NO: 197 is the determined cDNA sequence for CT632 (also known as 27922).

SEQ ID NO: 198 is the predicted amino acid sequence for CT502 (SEQ ID NO: 187).

SEQ ID NO: 199 is the predicted amino acid sequence for CT507 (SEQ ID NO: 188).
SEQ ID NO: 200 is the predicted amino acid sequence for CT521 (SEQ ID NO: 189).
SEQ ID NO: 201 is the predicted amino acid sequence for CT544 (SEQ ID NO: 190).
SEQ ID NO: 202 is the predicted amino acid sequence for CT606 (SEQ ID NO: 194).
5 SEQ ID NO: 203 is the predicted amino acid sequence for CT607 (SEQ ID NO: 195).
SEQ ID NO: 204 is the predicted amino acid sequence for CT632 (SEQ ID NO: 197).
SEQ ID NO: 205 is the determined cDNA sequence for clone 25244.
SEQ ID NO: 206 is the determined cDNA sequence for clone 25245.
SEQ ID NO: 207 is the determined cDNA sequence for clone 25246.
10 SEQ ID NO: 208 is the determined cDNA sequence for clone 25248.
SEQ ID NO: 209 is the determined cDNA sequence for clone 25249.
SEQ ID NO: 210 is the determined cDNA sequence for clone 25250.
SEQ ID NO: 211 is the determined cDNA sequence for clone 25251.
SEQ ID NO: 212 is the determined cDNA sequence for clone 25252.
15 SEQ ID NO: 213 is the determined cDNA sequence for clone 25253.
SEQ ID NO: 214 is the determined cDNA sequence for clone 25254.
SEQ ID NO: 215 is the determined cDNA sequence for clone 25255.
SEQ ID NO: 216 is the determined cDNA sequence for clone 25256.
SEQ ID NO: 217 is the determined cDNA sequence for clone 25257.
20 SEQ ID NO: 218 is the determined cDNA sequence for clone 25259.
SEQ ID NO: 219 is the determined cDNA sequence for clone 25260.
SEQ ID NO: 220 is the determined cDNA sequence for clone 25261.
SEQ ID NO: 221 is the determined cDNA sequence for clone 25262.
SEQ ID NO: 222 is the determined cDNA sequence for clone 25263.
25 SEQ ID NO: 223 is the determined cDNA sequence for clone 25264.
SEQ ID NO: 224 is the determined cDNA sequence for clone 25265.
SEQ ID NO: 225 is the determined cDNA sequence for clone 25266.
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SEQ ID NO: 229 is the determined cDNA sequence for clone 25271.

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5 SEQ ID NO: 234 is the determined cDNA sequence for clone 25276.
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10 SEQ ID NO: 239 is the determined cDNA sequence for clone 25282.
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20 SEQ ID NO: 249 is the determined cDNA sequence for clone 25292.
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SEQ ID NO: 253 is the determined cDNA sequence for clone 25296.
25 SEQ ID NO: 254 is the determined cDNA sequence for clone 25297.
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30 SEQ ID NO: 259 is the determined cDNA sequence for clone 25422.
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SEQ ID NO: 261 is the determined cDNA sequence for clone 25424.
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10 SEQ ID NO: 270 is the determined cDNA sequence for clone 25434.
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SEQ ID NO: 273 is the determined cDNA sequence for clone 25437.
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SEQ ID NO: 300 is the determined cDNA sequence for clone 25860.
10 SEQ ID NO: 301 is the determined cDNA sequence for clone 25861.
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SEQ ID NO: 303 is the determined cDNA sequence for clone 25863.
SEQ ID NO: 304 is the determined cDNA sequence for clone 25864.
SEQ ID NO: 305 is the determined cDNA sequence for clone 25865.
15 SEQ ID NO: 306 is the determined cDNA sequence for clone 25866.
SEQ ID NO: 307 is the determined cDNA sequence for clone 25867.
SEQ ID NO: 308 is the determined cDNA sequence for clone 25868.
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SEQ ID NO: 310 is the determined cDNA sequence for clone 25870.
20 SEQ ID NO: 311 is the determined cDNA sequence for clone 25871.
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SEQ ID NO: 313 is the determined cDNA sequence for clone 25873.
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SEQ ID NO: 315 is the determined cDNA sequence for clone 25876.
25 SEQ ID NO: 316 is the determined cDNA sequence for clone 25877.
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30 SEQ ID NO: 321 is the determined cDNA sequence for clone 25882.
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5 SEQ ID NO: 327 is the determined cDNA sequence for clone 25888.
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SEQ ID NO: 329 is the determined cDNA sequence for clone 25890.
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10 SEQ ID NO: 332 is the determined cDNA sequence for clone 25895.
SEQ ID NO: 333 is the determined cDNA sequence for clone 25896.
SEQ ID NO: 334 is the determined cDNA sequence for clone 25897.
SEQ ID NO: 335 is the determined cDNA sequence for clone 25899.
SEQ ID NO: 336 is the determined cDNA sequence for clone 25900.
15 SEQ ID NO: 337 is the determined cDNA sequence for clone 25901.
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20 SEQ ID NO: 342 is the determined cDNA sequence for clone 25907.
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30 SEQ ID NO: 352 is the determined cDNA sequence for clone 25917.
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10 SEQ ID NO: 363 is the determined cDNA sequence for clone 25929.
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10 SEQ ID NO: 394 is the determined cDNA sequence for clone 31986.
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15 SEQ ID NO: 399 is the determined cDNA sequence for clone 32012.
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SEQ ID NO: 407 is the determined cDNA sequence for clone 31963.
SEQ ID NO: 408 is the determined cDNA sequence for clone 31989.
25 SEQ ID NO: 409 is the determined cDNA sequence for clone 32015.
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SEQ ID NO: 416 is the determined cDNA sequence for clone 31935.
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5 SEQ ID NO: 420 is the determined cDNA sequence for clone 31971.
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20 SEQ ID NO: 435 is the determined cDNA sequence for clone 32010.
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25 SEQ ID NO: 440 is the determined cDNA sequence for clone 31947.
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SEQ ID NO: 444 is the determined cDNA sequence for clone 31984.
30 SEQ ID NO: 445 is the determined cDNA sequence for clone 32024.
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SEQ ID NO: 447 is the determined cDNA sequence for clone 31943.
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5 SEQ ID NO: 451 is the determined cDNA sequence for clone 32019.
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SEQ ID NO: 455 is the determined cDNA sequence for clone 31955.
10 SEQ ID NO: 456 is the determined cDNA sequence for clone 31951.
SEQ ID NO: 457 is the determined cDNA sequence for clone 31970.
SEQ ID NO: 458 is the determined cDNA sequence for clone 31962.
SEQ ID NO: 459 is the determined cDNA sequence for clone 32001.
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15 SEQ ID NO: 461 is the determined cDNA sequence for clone 31944.
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SEQ ID NO: 465 is the determined cDNA sequence for clone 31841.
20 SEQ ID NO: 466 is the determined cDNA sequence for clone 31847.
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SEQ ID NO: 469 is the determined cDNA sequence for clone 31855.
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25 SEQ ID NO: 471 is the determined cDNA sequence for clone 31861.
SEQ ID NO: 472 is the determined cDNA sequence for clone 31868.
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30 SEQ ID NO: 476 is the determined cDNA sequence for clone 31877.
SEQ ID NO: 477 is the determined cDNA sequence for clone 31878.

SEQ ID NO: 478 is the determined cDNA sequence for clone 31885.

SEQ ID NO: 479 is the determined cDNA sequence for clone 31888.

SEQ ID NO: 480 is the determined cDNA sequence for clone 31890.

SEQ ID NO: 481 is the determined cDNA sequence for clone 31893.

5 SEQ ID NO: 482 is the determined cDNA sequence for clone 31898.

SEQ ID NO: 483 is the determined cDNA sequence for clone 31901.

SEQ ID NO: 484 is the determined cDNA sequence for clone 31909.

SEQ ID NO: 485 is the determined cDNA sequence for clone 31910.

SEQ ID NO: 486 is the determined cDNA sequence for clone 31914.

10

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as colon cancer. The compositions described herein may include colon tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a colon tumor protein or a variant thereof. A "colon tumor protein" is a protein that is expressed in colon tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain colon tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with colon cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence.

25 Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human colon tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486.

5 COLON TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a colon tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode
10 a portion of a colon tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a colon tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain
15 introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous
20 sequence that encodes a colon tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein.
25 Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native colon tumor protein or a portion thereof.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for
30 maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and

compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

5 Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins. – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of
10 Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenesis pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M.
15 (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad., Sci. USA* 80:726-730.

 Preferably, the "percentage of sequence identity" is determined by comparing
20 two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequence (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is
25 calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

30 Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of

hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native colon tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C
5 for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to
10 differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles
15 may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least two
20 fold greater in a colon tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA
25 prepared from cells expressing the proteins described herein, such as colon tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable
30 library (*e.g.*, a colon tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide

probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

5 For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring
10 Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using
15 standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

 Alternatively, there are numerous amplification techniques for obtaining a full
20 length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about
25 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

 One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and
30 used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by

amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the
5 known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic. 1*:111-19, 1991) and walking PCR (Parker et al.,
10 *Nucl. Acids Res. 19*:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using
15 well known programs (e.g., NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence.

Certain nucleic acid sequences of cDNA molecules encoding portions of colon tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486. These polynucleotides were isolated from colon tumor cDNA libraries using conventional and/or
20 PCR-based subtraction techniques, as described below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (see
25 Adelman et al., *DNA 2*:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a colon tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered
30 to a patient such that the encoded polypeptide is generated *in vivo* (e.g., by transfecting

antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a colon tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into
5 cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of
10 polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

15 A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30
20 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such
25 as inosine, queosine and wybutosine, as well as acetyl- methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids,
30 phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In

general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

COLON TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a colon tumor protein or a variant thereof, as described herein. As noted above, a "colon tumor protein" is a protein that is expressed by colon tumor cells. Proteins that are colon tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with colon cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or

heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a colon tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native colon tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native colon tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native colon tumor protein in one or more substitutions, deletions, additions and/or insertions, such

that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydrophobic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain non-conservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydrophobic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (*e.g.*, poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A

fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing
5 fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant
10 protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that
15 the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into
20 the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred
25 peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al., *Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1
30 to about 50 amino acids in length. Linker sequences are not required when the first and

second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see*, for example, Stoute et al. *New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid

proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10:795-798, 1992*). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

5 In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95%
10 pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-
15 binding fragments thereof, that specifically bind to a colon tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a colon tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a colon tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules
20 such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3
25 L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as colon cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a colon tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the
30 disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies

this requirement, biological samples (e.g., blood, sera, sputum, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein; or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (i.e., reactivity with the polypeptide of interest). Such cell lines may be produced, for example,

from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide.

Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid.

Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction
5 between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

10 Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate
15 the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl
20 groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable
25 linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S.
30 Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may
5 be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*,
10 U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No.
15 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

20 A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

25 T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a colon tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow,
30 peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from

Nexell Therapeutics Inc., Irvine, CA . Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

5 T cells may be stimulated with a colon tumor polypeptide, polynucleotide encoding a colon tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a colon tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

10 T cells are considered to be specific for a colon tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as
15 described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a colon tumor polypeptide (100
20 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., *Current Protocols in Immunology*, vol. 1, Wiley Interscience
25 (Greene 1998)). T cells that have been activated in response to a colon tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Colon tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

30 For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a colon tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro*

or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a colon tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a colon tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a colon tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant may be any substance that enhances or potentiates an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the

necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (*e.g.*, vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993; and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (*e.g.*, polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and

5,075,109.

Such compositions may also comprise buffers (*e.g.*, neutral buffered saline or phosphate buffered saline), carbohydrates (*e.g.*, glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (*e.g.*, aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (see US Patent Nos. 5 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a 10 monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is 15 described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of 20 polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within 25 a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be 30 treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical

compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcγ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a colon tumor protein (or portion or other variant thereof) such that the colon tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the colon tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as colon cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or

may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may
5 be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as
10 polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells
15 include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and
20 transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding
25 single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient
30 number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast and/or B cells, may be pulsed with immunoreactive

polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever et al., *Immunological Reviews* 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 μ g to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient,

but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a colon tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more colon tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, sputum, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as colon cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a colon tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of

the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length colon tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.*, Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with colon cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

5 The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting
10 the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the
15 addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as colon cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred
20 embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to
25 the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value
30 that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered

positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

5 In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent
10 flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of
15 immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to
20 generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

25 Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use colon tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such
30 colon tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a colon tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a colon tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with one or more representative polypeptides (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of colon tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a colon tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a colon tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the colon tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a colon tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a colon tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will

hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486. Techniques for both PCR based assays and hybridization assays are well known in the art (see, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may

also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple colon tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a colon tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a colon tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a colon tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a colon tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

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Example 1

ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY
PCR-BASED SUBTRACTION AND MICROARRAY ANALYSIS

A cDNA library was constructed in the PCR2.1 vector (Invitrogen, Carlsbad,
10 CA) by subtracting a pool of three colon tumors with a pool of normal colon, spleen, brain,
liver, kidney, lung, stomach and small intestine using PCR subtraction methodologies
(Clontech, Palo Alto, CA). The subtraction was performed using a PCR-based protocol,
which was modified to generate larger fragments. Within this protocol, tester and driver
double stranded cDNA were separately digested with five restriction enzymes that recognize
15 six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in
an average cDNA size of 600 bp, rather than the average size of 300 bp that results from
digestion with RsaI according to the Clontech protocol. This modification did not affect the
subtraction efficiency. Two tester populations were then created with different adapters, and
the driver library remained without adapters.

20 The tester and driver libraries were then hybridized using excess driver cDNA.
In the first hybridization step, driver was separately hybridized with each of the two tester
cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester
cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs, and
(d) unhybridized driver cDNAs. The two separate hybridization reactions were then
25 combined, and rehybridized in the presence of additional denatured driver cDNA. Following
this second hybridization, in addition to populations (a) through (d), a fifth population (e) was
generated in which tester cDNA with one adapter hybridized to tester cDNA with the second
adapter. Accordingly, the second hybridization step resulted in enrichment of differentially
expressed sequences which could be used as templates for PCR amplification with adaptor-
30 specific primers.

The ends were then filled in, and PCR amplification was performed using
adaptor-specific primers. Only population (e), which contained tester cDNA that did not

hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are over-expressed in colon tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

To characterize the complexity and redundancy of the subtracted library, 96 clones were randomly picked and 65 were sequenced, as previously described. These sequences were further characterized by comparison with the most recent Genbank database (April, 1998) to determine their degree of novelty. No significant homologies were found to 21 of these clones, hereinafter referred to as 11092, 11093, 11096, 11098, 11103, 11174, 11108, 11112, 11115, 11117, 11118, 11134, 11151, 11154, 11158, 11168, 11172, 11175, 11184, 11185 and 11187. The determined cDNA sequences for these clones are provided in SEQ ID NO: 48, 49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101 and 109-111, respectively.

Two-thousand clones from the above mentioned cDNA subtraction library were randomly picked and submitted to a round of PCR amplification. Briefly, 0.5 μ l of glycerol stock solution was added to 99.5 μ l of pcr MIX (80 μ l H₂O, 10 μ l 10X PCR Buffer, 6 μ l 25 mM MgCl₂, 1 μ l 10 mM dNTPs, 1 μ l 100 mM M13 forward primer (CACGACGTTGTAAAACGACGG), 1 μ l 100 mM M13 reverse primer (CACAGGAAACAGCTATGACC)), and 0.5 μ l 5 u/ml Taq polymerase (primers provided by (Operon Technologies, Alameda, CA). The PCR amplification was run for thirty cycles under the following conditions: 95°C for 5 min., 92°C for 30 sec., 57°C for 40 sec., 75°C for 2 min. and 75°C for 5 minutes.

mRNA expression levels for representative clones were determined using microarray technology (Synteni, Palo Alto, CA) in colon tumor tissues (n=25), normal colon tissues (n=6), kidney, lung, liver, brain, heart, esophagus, small intestine, stomach, pancreas, adrenal gland, salivary gland, resting PBMC, activated PBMC, bone marrow, dendritic cells, spinal cord, blood vessels, skeletal muscle, skin, breast and fetal tissues. The number of tissue samples tested in each case was one (n=1), except where specifically noted above; additionally, all the above-mentioned tissues were derived from humans. The PCR

amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, and fluorescent-labeled cDNA probes were generated by reverse transcription according to the protocol provided by Synteni. The microarrays were probed with the labeled
5 cDNA probes, the slides scanned, and fluorescence intensity was measured. This intensity correlates with the hybridization intensity.

One hundred and forty nine clones showed two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. These cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied
10 Biosystems Division Automated Sequencer Model 373A and/or Model 377 (Foster City, CA). These sequences were compared to known sequences in the most recent GenBank database. No significant homologies to human gene sequences were found in forty nine of these clones, represented by the following sixteen cDNA consensus sequences: SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46 and 47, hereinafter referred to as Contig 2, 8,
15 13, 14, 20, 23, 29, 31, 35, 32, 36, 38, 41, 42, 50 and 51, respectively). Contig 29 (SEQ ID NO: 30) was found to be a Rat GSK-3- β -interacting protein Axil homolog. Also, Contigs 31 and 35 (SEQ ID NO: 32 and 33, respectively) were found to be a Mus musculus GOB-4 homolog. The determined cDNA sequences of SEQ ID NO: 1, 3-7, 9-14, 17-21, 23, 25-29, 31, 35, 37, 39, 42-45, 50, 51, 53, 55-58, 61-64, 70-78, 80-88, 91, 92, 94-98, 102-108 and 112
20 were found to show some homology to previously identified genes sequences.

Microarray analysis demonstrated Contig 2 (SEQ ID NO: 2) showed over-expression in 34% of colon tumors tested, as well as increased expression in normal pancreatic tissue, with no over-expression in normal colon tissues. Upon further analysis, Contigs 2, 8 and 23 were found to share homology to the known gene GW112. Contigs 4, 5,
25 9 and 52 showed homology to carcinoembryonic antigen (SEQ ID NO: 3, 4, 5 and 6, respectively). A representative sampling of these fragments showed over-expression in 85% of colon tumors, with over-expression in normal bone marrow and 3/6 normal colon tissues. Contig 6 (SEQ ID NO: 7), showing homology to the known gene sequence for villin, and was over-expressed in about half of all colon tumors tested, with a limited degree of low level
30 over-expression in normal colon. Contig 12 (SEQ ID NO: 14), showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P, was over-expressed in

approximately 70% of colon tumors tested, with low over-expression in 1/6 normal colon samples. Contig 14, also referred to as 14261 (SEQ ID NO: 16), showing no significant homology to any known gene, showed over-expression in 44% of colon tumors tested, with low level expression in half of normal colon tissues, as well as small intestine and pancreatic tissue. Contig 18 (SEQ ID NO: 21), showing homology to the known gene for L1-cadherin, showed over-expression in approximately half of colon tumors and low level over-expression in 3/6 normal colon tissues tested. Contig 22 (SEQ ID NO: 23), showing homology to Bumetanide-sensitive Na-K-Cl cotransporter was over-expressed in 70% of colon tumors and no over-expression in all normal tissues tested. Contig 25 (SEQ ID NO: 25), showing homology to macrophage inflammatory protein-3 α , was over-expressed in over 40% of colon tumors and in activated PBMC. Contigs 26 and 48 (SEQ ID NOS: 25 and 26), showing homology to the sequence for laminin, was over-expressed in 48% of colon tumors and with low over-expression in stomach tissue. Contig 28 (SEQ ID NO: 29), showing homology to the known gene sequence for Chromosome 16 BAC clone CIT987SK-A-363E6, was over-expressed in 33% of colon tumors tested with normal stomach and 2/6 normal colon tissues showing low level over-expression. Contigs 29, 31 and 35 (SEQ ID NOS: 30, 32 and 33, respectively), also referred to as C751P, an unknown sequence showing limited and partial homology to Rat GSK-3 β -interacting protein Axil homolog and Mus musculus GOB-4 homolog, was over-expressed in 74% of colon tumors and no over-expression in all normal tissues tested. Contig 34 (SEQ ID NO: 35), showing homology to the known sequence for desmoglein 2, was over-expressed in 56% of colon tumors and showed low level over-expression in 1/6 normal colon tissues. Contig 36 (SEQ ID NO: 36), an unknown sequence also referred to as C793P, showed over-expression in 30% of colon tumor tissues tested. Contig 37 and 14287.2 (SEQ ID NOS: 37 and 116), an unknown sequence, but with limited (89%) homology to the known sequence for putative transmembrane protein was over-expressed in 70% of colon tumors, as well as in normal lung tissue and 3/6 normal colon tissues tested. Contig 38, also referred to as C796P and 14219 (SEQ ID NO: 38), showing no significant homology to any known gene, was over-expressed in 38% in colon tumors and no elevated over-expression in any normal tissues. Contig 41 (SEQ ID NO: 40), also referred to as C799P and 14308, an unknown sequence showing no significant homology to any known gene, was over-expressed in 22% of colon tumors. Contig 42, (SEQ ID NO: 41), also

referred to as C794P and 14309, an unknown sequence with no significant homology to any known gene, was over-expressed in 63% of colon tumors tested, as well as in 3/6 normal colon tissues. Contig 43 (SEQ ID NO: 42), showing homology to the known sequence for Chromosome 1 specific transcript KIAA0487 was over-expressed in 85% of colon tumors tested and in normal lung and 4/6 normal colon tissues. Contig 49 (SEQ ID NO: 45), showing homology to the known sequence for pump-1, was over-expressed in 44% of colon tumors and no over-expression in all normal tissues tested. Contig 50 (SEQ ID NO: 46), also referred to as C792P and 18323, showing no significant homology to any known gene, was over-expressed in 33% of colon tumors with no detectable over-expression in any normal tissues tested. Contig 51 (SEQ ID NO: 47), also referred to as C795P and 14317 was over-expressed in 11% of colon tumors.

Additional microarray analysis yielded seven clones showing two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. Three of these clones demonstrated particularly good colon tumor specificity, and are represented by SEQ ID NO: 115, 116 and 120. Specifically, SEQ ID NO: 115, referred to as C791P or 14235, which shows homology to the known gene sequence for H. sapiens chromosome 21 derived BAC containing ets-2 gene, was over-expressed in 89% of colon tumors tested and in 5/6 normal colon tissues, as well as over-expressed at low levels in normal lung and activated PBMC. Microarray analysis for SEQ ID NO: 116 is discussed above. SEQ ID NO: 120, referred to as 14295, showing homology to the known gene sequence for secreted cement gland protein XAG-2 homolog, was over-expressed in 70% of colon tumors and in 5/6 normal colon tissues, as well as low level over-expression in normal small intestine, stomach and lung. All clones showing over-expression in colon tumor were sequenced and these sequences compared to the most recent Genbank database (February 12, 1999). Of the seven clones, three contained sequences that did not share significant homology to any known gene sequences, represented by SEQ ID NO: 116, 117 and 119. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in colon. The determined cDNA sequences of the remaining clones (SEQ ID NO: 113-115 and 120) were found to show some homology to previously identified genes.

Further analysis identified a clone which was recovered several times by PCR subtraction and by expression screening using a mouse anti-scld antiserum. The determined

full length cDNA sequence for this clone is provided in SEQ ID NO: 121, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 122. This clone is homologous with the known gene Beta IG-H3, as disclosed in U.S. Patent No. 5,444,164. Microarray analysis demonstrated this clone to be over-expressed in 75 to 80% of colon tumors tested (n=27), with no over-expression in normal colon samples (n=6), but with some low level over-expression in other normal tissues tested.

Further analysis of the PCR-subtraction library described above led to the isolation of longer cDNA sequences for the clones of SEQ ID NO: 30, 115, 46, 118, 41, 47, 38, 113, 14 and 40 (known as C751P, C791P, C792P, C793P, C794P, C795P, C796P, C797P, C798P and C799P, respectively). These determined cDNA sequences are provided in SEQ ID NO: 123-132, respectively.

Using PCR subtraction methodology described above with minor modifications, transcripts from a pool of three moderately differentiated colon adenocarcinoma samples were subtracted with a set of transcripts from normal brain, pancreas, bone marrow, liver, heart, lung, stomach and small intestine. Modifications of the above protocol were included at the cDNA digestion steps and in the tester to drive hybridization ratios. In a first subtraction, the restriction enzymes PvuII, DraI, MscI and StuI were used to digest cDNAs, and the tester to driver ratio was 1:40, as suggested by Clontech. In a second subtraction, DraI, MscI and StuI were used for cDNA digestion and a tester to driver ratio of 1:76 was used. Following the PCR amplification steps, the cDNAs were clones into pCR2.1 plasmid vector. The determined cDNA sequences of 167 isolated clones are provided in SEQ ID NO: 205-371. These sequences were compared to sequences in the public databases as described above. The sequences of SEQ ID NO: 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369 and 371 were found to show some homology to previously identified ESTs. The remaining sequences were found to show some homology to previously identified genes.

Using the PCR subtraction technology described above, a cDNA library from a pool of primary colon tumors was subtracted with a cDNA library prepared from normal tissues, including brain, bone marrow, kidney, heart, lung, liver, pancreas, small intestine,

stomach and trachea. The determined cDNA sequences for 90 clones isolated in this subtraction are provided in SEQ ID NO: 372-461. Comparison of these sequences with those in the public databases as described above, revealed no homologies to the sequences of SEQ ID NO: 426, 445 and 453. The sequences of SEQ ID NO: 372-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455 and 457-461 showed some homology to previously identified genes, while the sequences of SEQ ID NO: 379, 405, 407, 408, 418, 424, 430-432, 437, 442, 444, 452 and 456 showed some homology to previously isolated ESTs.

Example 2

ISOLATION OF TUMOR POLYPEPTIDES USING SCID-PASSAGED TUMOR RNA

Human colon tumor antigens were obtained using SCID mouse passaged colon tumor RNA as follows. Human colon tumor was implanted in SCID mice and harvested, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. 5,986,170 . First strand cDNA was synthesized from poly A⁺ RNA from three SCID mouse-passaged colon tumors using a Lambda ZAP Express cDNA synthesis kit (Stratagene). The reactions were pooled and digested with RNase A, T1 and H to cleave the RNA and then treated with NaOH to degrade the RNA. The resulting cDNA was annealed with biotinylated (Vector Labs, Inc., Burlingame, CA) cDNA from a normal resting PBMC plasmid library (constructed from Superscript plasmid System, Gibco BRL), and subtracted with streptavidin by phenol/chloroform extraction. Second strand cDNA was synthesized from the subtracted first strand cDNA and digested with S1 nuclease (Gibco BRL). The cDNA was blunted with Pfu polymerase and EcoRI adaptors (Stratagene) were ligated to the ends. The cDNA was phosphorylated with T4 polynucleotide kinase, digested with restriction endonuclease XhoI, and size selected with Sephacryl S-400 (Sigma). Fractions were pooled, ligated to Lambda ZAP Express arms (Stratagene) and packaged with Gigapack Gold III extract (Stratagene). Random plaques were picked, phagemid was excised, transformed into XL0LR cells (Stratagene) and resulting plasmid DNA (Qiagen Inc., Valencia, CA) was sequenced as described above. The determined cDNA sequences for 17

clones isolated as described above are provided in SEQ ID NO: 133-151, wherein 133 and 134 represent partial sequences of a clone referred to as CoSub-3 and SEQ ID NO: 135 and 136 represent partial sequences of a clone referred to as CoSub-13. These sequences were compared with those in the public databases as described above. The sequences of SEQ ID NO: 139 and 149 showed no significant homologies to any previously identified sequences. The sequences of SEQ ID NO: 138, 140, 141, 142, 143, 148 and 149 showed some homology to previously isolated expressed sequence tags (ESTs). The sequences of SEQ ID NO: 133-137, 144-147, 150 and 151 showed some homology to previously isolated gene sequences.

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Example 3

USE OF MOUSE ANTISERA TO IDENTIFY DNA SEQUENCES ENCODING COLON TUMOR ANTIGENS

This example illustrates the isolation of cDNA sequences encoding colon tumor antigens by screening of colon tumor cDNA libraries with mouse anti-tumor sera.

A cDNA expression library was prepared from SCID mouse-passaged human colon tumor poly A⁺ RNA using a Stratagene (La Jolla, CA) Lambda ZAP Express kit, following the manufacturer's instructions. Sera was obtained from the colon tumor-bearing SCID mouse. This serum was injected into normal mice to produce anti-colon tumor serum. Approximately 600,000 PFUs were screened from the unamplified library using this antiserum. Using a goat anti-mouse IgG-A-M (H+L) alkaline phosphatase second antibody developed with NBT/BCIP (BRL Labs.), positive plaques were identified. Phage was purified and phagemid excised for several clones with inserts in a pBK-CMV vector for expression in prokaryotic or eukaryotic cells.

The determined cDNA sequences for 46 of the isolated clones are provided in SEQ ID NO: 152-197. The predicted amino acid sequences for the cDNA sequences of SEQ ID NO: 187, 188, 189, 190, 194, 195 and 197 are provided in SEQ ID NO: 198-204, respectively. The determined cDNA sequences were compared with those in the public database as described above. The sequences of SEQ ID NO: 156, 168, 184, 189, 192 and 196 showed some homology to previously isolated ESTs. The sequences of SEQ ID NO: 152-

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155, 157-167, 169-182, 183, 185-188, 190, 194, 195 and 197 showed some homology to previously identified genes.

Example 4

5 ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY CONVENTIONAL SUBTRACTION

Two cDNA libraries were constructed and used to create a subtracted cDNA library as follows.

10 Using the GibcoBRL Superscript Plasmid System with minor modifications, two cDNA libraries were created. The first library, referred to as CTCL, was prepared from a pool of mRNA samples from three colon adenocarcinoma tissue samples. Two of the samples were described as Duke's stage C and one as Duke's stage B. All three samples were grade III in histological status. A second library (referred to as DriverLibpcDNA3.1+)
15 was prepared from a pool of normal tissues, namely liver, pancreas, skin, bone marrow, resting PBMC, stomach and brain. Both libraries were prepared using the manufacturer's instructions with the following modifications: an EcoRI-NotI 5' cDNA adapter was used instead of the provided reagent; the vector pCDNA3.1(+) (Invitrogen) was substituted for the pSPORT vector; and the ligated DNA molecules were transformed into ElectroMaxDH10B
20 electrocompetent cells. Clones from the libraries were analyzed by restriction digest and sequencing to determine average insert size, quality of the library and complexity of the library. DNA was prepared from each library and digested.

The driver DNA was biotinylated and hybridized with the colon library tester DNA at a ratio of 10:1. After two rounds of hybridizations, streptavidin incubations and
25 extractions, the remaining colon cDNAs were size-selected by column chromatography and cloned into the pCMV-Script vector from Stratagene. Clones from this subtracted library (referred to as CTCL-S1) were characterized as described above for the unsubtracted libraries.

The determined cDNA sequences for 18 clones isolated from the CTCL-S1 library are provided in SEQ ID NO: 462-479. Comparison of these sequences with those in
30 the public databases, as described above, revealed no significant homologies to the sequences

of SEQ ID NO: 476, 477 and 479. The remaining sequences showed some homology to previously identified genes.

In further studies, a cDNA library was prepared from a pool of mRNA from three metastatic colon adenocarcinomas derived from liver tissue samples. All samples were described as Duke's stage D. Conventional subtraction was performed as described above, using the DriverLibpcDNA3.1+ library described above as the driver. The resulting subtracted library (referred to as CMCL-S1) was characterized by isolating a set of clones for restriction analysis and sequencing.

The determined cDNA sequences for 7 clones isolated from the CMCL-S1 library are provided in SEQ ID NO: 480-486. Comparison of these sequences with those in the public databases revealed no significant homologies to the sequence of SEQ ID NO: 483. The sequences of SEQ ID NO: 480-482 and 484-486 were found to show some homology to previously identified genes.

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Example 5

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

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From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

1. An isolated polypeptide comprising at least an immunogenic portion of a colon tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483;

(b) sequences that hybridize to a sequence of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168,

170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 5 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 122 and 198-204.

10 4. An isolated polynucleotide encoding at least 15 amino acid residues of a colon tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of 15 SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 20 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a colon tumor protein, or a variant 25 thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 30 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303,

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5 6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279,
10 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483.

 7. An isolated polynucleotide comprising a sequence that hybridizes to a
15 sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320,
20 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions.

 8. An isolated polynucleotide complementary to a polynucleotide
25 according to any one of claims 4-7.

 9. An expression vector comprising a polynucleotide according to any one of claims claim 4-8.

30 10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a colon tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24,
5 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378,
10 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.
12. A fusion protein comprising at least one polypeptide according to
15 claim 1.
13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.
20
14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.
15. A fusion protein according to claim 12, wherein the fusion protein
25 comprises an affinity tag.
16. An isolated polynucleotide encoding a fusion protein according to claim 12.
17. A pharmaceutical composition comprising a physiologically acceptable
30 carrier and at least one component selected from the group consisting of:

- 5 (a) a polypeptide according to claim 1;
(b) a polynucleotide according to claim 4;
(c) an antibody according to claim 11;
(d) a fusion protein according to claim 12; and
(e) a polynucleotide according to claim 16.

18. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:

- 10 (a) a polypeptide according to claim 1;
(b) a polynucleotide according to claim 4;
(c) an antibody according to claim 11;
(d) a fusion protein according to claim 12; and
(e) a polynucleotide according to claim 16.

15 19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20 20. A vaccine according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

25 22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 20.

30 23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide encoded by a polynucleotide recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486, and thereby inhibiting the development of a cancer in the patient.

30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is colon cancer.

32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-

197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

5

33. A method according to claim 32, wherein the biological sample is blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

35. A method for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
 - (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NO: 1-121, 123-197 and 205-486;
 - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
 - (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii),
- under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared according to the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

30

38. A method for inhibiting the development of a cancer in a patient,

comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- 5 (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iv) an antigen-presenting cell that expresses a polypeptide of (i) or
- 10 (ii);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

15 39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- 20 (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iii) an antigen-presenting cell that expresses a polypeptide of (i) or
- 25 (ii);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

30

40. A method for determining the presence or absence of a cancer in a

patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

5 (i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

10 (c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

41. A method according to claim 40, wherein the binding agent is an antibody.

15 42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

43. A method according to claim 40, wherein the cancer is colon cancer.

20 44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a colon tumor protein, wherein the tumor protein
25 comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

30 (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

45. A method according to claim 44, wherein the binding agent is an
5 antibody.

46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

10 47. A method according to claim 44, wherein the cancer is a colon cancer.

48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an
15 oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes
20 to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

25 49. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

50. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

30

51. A method for monitoring the progression of a cancer in a patient,

comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 11; and
- (b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is selected

from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that
5 hybridize under moderately stringent conditions to a polynucleotide that encodes a colon
tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded
by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-
34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119,
123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-
10 212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254,
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310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378,
380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455,
457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotides.

15

59. A oligonucleotide according to claim 58, wherein the oligonucleotide
comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 2, 8, 15, 16, 22,
24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111,
116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205,
20 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250,
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303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-
378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454,
455, 457-461, 476, 477, 479 and 483.

25

60. A diagnostic kit, comprising:

(a) an oligonucleotide according to claim 59; and

(b) a diagnostic reagent for use in a polymerase chain reaction or
hybridization assay.

SEQUENCE LISTING

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<120> COMPOUNDS FOR IMMUNOTHERAPY AND
DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

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<140> PCT

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 tgggtgttca tagtacgggt ggcatacaga accccacata ccatgaaggc gttagaagca 840
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 ttacraatca ccatgttacc agtgctggct tcagttgaat aaataaccca caatccattc 960
 tcatccacag caaagtcaat atcttgccaa gcaacattag catatgaaaa gcggttatta 1020
 taggcagcat tagggagagt ttgagtcaca gcaatcgtgt tgggtggtcag gttaactctg 1080
 gcaatattcc cggtgttgta catgttgacg tacatgttgt tgttgtaaac tgctgtacca 1140
 ctaccttgga c 1151

<210> 9
 <211> 604
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(604)
 <223> n = A,T,C or G

<400> 9
 ctgtgcaagg gctttacaaa aactgtgccca ggacttccca tgaggctgga ttgcttgatt 60
 catgttttat gagccccaca atactgaagc tccttttcca gggacttggc ataggcagtc 120
 aattccacat ttgggatagg tcctctctgg aagtgaatgt caggcagtga catccaagtt 180
 tctgcatgca gtgggttaac agccatgttt agggggaaca tgatttaaaa agtacatctc 240

```

tctccctcct cccccacatg cacaaggctc acatctcatt atggtgkcgg cccatgtcac    300
attaaagtgt gatacttkgg ttttgaaaac attcaaacag tctctgtgga aatctggaga    360
gaaattggcg gagagctgcc gtggtgcatt cctcctgtag tgcttcaagn taatgcttca    420
tcctttntta ataacttttg atagacaggg gctagtcgca cagacctctg ggaagccctg    480
gaaaacgctg atgcttggtt gaagatctca agcgcagagt ctgcaagttc atcccctctt    540
tcctgaggtc tgttggtggt aggctgcaga acattggtga tgacatggac cagccattt    600
gtgg                                           604

```

```

<210> 10
<211> 473
<212> DNA
<213> Homo sapien

```

```

<400> 10
tcgagaagat ccctagttag actttgaacc gtatcctggg cgacccagaa gccctgagag    60
acctgctgaa caaccacatc ttgaagtcag ctatgtgtgc tgaagccatc gttgcggggc    120
tgctgtgga gacctggag ggcacgacac tggagggtgg ctgcagcggg gacatgtca    180
ctatcaacgg gaaggcgatc atctccaata aagacatcct agccaccaac ggggtgatcc    240
actacattga tgagctactc atcccagact cagccaagac actatttgaa ttggctgcag    300
agtctgatgt gtccacagcc attgaccttt tcagacaagc cggcctcggc aatcatctct    360
ctggaagtga gcggttgacc ctectgggct cccctgaatt ctgtattcaa agatggaacc    420
cctccaattg atgcccatac aaggaatttg ctctggaacc acataattaa aga          473

```

```

<210> 11
<211> 411
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(411)
<223> n = A,T,C or G

```

```

<400> 11
tcctcattgg tcggggccaa aagcgtgtac tggccgttac cttcaagcat cgtgttgagc    60
cctgatgcag ccacagcagc ccgaagggtc tcaaagggtg cctcgatctc aatgatctgc    120
tggatgttgt tggatgatgt ggagatgacc ttatcgatga ggtgcaccac cccgttgggt    180
gcatggttgt cggctttyar carccgggca cagttcacag ttacaatccc attaggatag    240
tggatgatct nggatgttgg aattcttgga catagnaggt gaggggtcat gccctgtgtt    300
cagctcatca gtcaggactc gcctgccac catatggtaa gcsgragggc atttgagcag    360
ctcaatgttt gacattgctg gaccagggga gttccagcac ttctangang a          411

```

```

<210> 12
<211> 560
<212> DNA
<213> Homo sapien

```

```

<400> 12
tacttgcttg gagatwgcyt tykckwmttg ytcwrawgtc cgtggataga gaaatctctg    60
caggcaagtt gctccagagc atattgcagg acaagcctgt aacgaatagt taaattcacg    120
gcatctggat tectaattct tttccgaaat ggcagggtgt agtgcctgta taaaatattc    180
tatgtttacc ttcaacttct tgttctggct atgtggatc ttgatcctag cattagcaat    240
atgggtacga gtaagcaatg actctcaagc aatttttggg tctgaagatg taggctctag    300
ctcctacgtt gctgtggaca tattgattgc tgtagggtgc atcatcatga ttctgggctt    360
cctgggatgc tgcggtgcta taaaagaaag tcgctgcatg cttctgttgt ttttcatagg    420

```

cttgcttctg atcctgctcc tgcaggtggg cgacaggtat cctaggagct gttttcaa	480
ctaatgtctga tgcattgtg aatgaaactc tctatgaaaa cacaagctt ttgagcgcca	540
caggggaaa tgaaaaaaca	560

<210> 13
 <211> 150
 <212> DNA
 <213> Homo sapien

<400> 13	
gggcaggctg tcttttttaa atgtctcggc tagctagacc acagatatct tctagacata	60
ttgaacacat ttaagatttg agggatataa gggaaaatga tatgaatgtg tatttttact	120
caaaataaaa gtaactgttt acgttggtga	150

<210> 14
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 14	
ctgctgcctg tggcgtgtgt gggctggatc ccttgaaggc tgagtttttg agggcagaaa	60
gctagctatg ggtagccagg tgttacaaag gtgctgctcc ttctccaacc cctacttgg	120
ttccctcacc ccaagcctca tgttcatacc agccagtggg ttcagcagaa cgcatgacac	180
cttatcacct ccctccttgg gtgagctctg aacaccagct ttggccctc cacagtaagg	240
ctgctacatc aggggcaacc ctggctctat cattttcctt ttttgccaaa aggaccagta	300
gcataggtga gccctgagca ctaaaaggag gggctcctga agctttccca ctatagtgtg	360
gagttctgtc cctgaggtgg gtacagcagc cttggttctc ctg	403

<210> 15
 <211> 688
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (688)
 <223> n = A,T,C or G

<400> 15	
caaagcacat ttaatcatt tattttaaaa gggggagtaa agcatttaa ctgccaatcc	60
tatagactag gacttgaaca tcaaagggaa aatagacaaa gactagatga taaagtcatt	120
caaaagcaca gaagcacatc acatacacca gcaaggtttc caactactgc actgattaac	180
tagatactct caatagcttt tctatagctc gtcctagaaa aaaaaattaa attttcattt	240
tcttacaagt tccaggctta aacaaaggca aaaattacat gcaacaactg atacactcat	300
aagttgcaca tatgctccaa ggtctttatt agataacaat aaatgctagc actttgtcac	360
tgccatcaga ttttccttat agtcttagag tcatgtaaat aaaagttcca taatgaaatt	420
aaagaaaatt aatttttcta atcttagatc agttccatag aaaactatta attttttaa	480
agtaggcagt agaagggggg ttggtggggg ttgaattggg tagtaagtct gggttcta	540
ttctgagctg cctttggaag gaagttatga ggtagaagat tctactgact tttagtaagg	600
tggacaatga gagaaaagaa aaagcaggtg cctcatcnnn agatccttnt ggtatttatn	660
tgccangtnc nanntaatnc atanaaag	688

<210> 16
 <211> 408
 <212> DNA

<213> Homo sapien

<400> 16

caggatcatca	agatgactta	caggatgtaa	tagggagagc	tgtcgagatt	gggtgttaaaa	60
agtttatgat	tacaggtgga	aatctacaag	acagtaaaga	tgcactgcat	ttggcacaaa	120
caaattggat	gtttttcagt	acagttggat	gtcgtcctac	aagatgtggt	gaatttgaaa	180
agaataaccc	tgatctttac	ttaaaggagt	tgctaaatct	tgctgaaaac	aataaaggga	240
aagttgtggc	aataggagaa	tgcggacttg	attttgacct	gactgcagtt	ttgtcccaa	300
gatactcaac	tcaaatat	tgaaaaacag	tttgaactgt	cagaacaaac	aaaattacca	360
atgtttcttc	attgtccgaa	actcacatgc	tgaatttttg	gacataat		408

<210> 17

<211> 407

<212> DNA

<213> Homo sapien

<400> 17

ggctctgggg	aggccctagg	ggagcaccgt	gatggagagg	acagagcagg	ggctccagca	60
ccttctttct	ggactggcgt	tcacctccct	gctcagtgt	tgggtccac	gggcagggt	120
cagagcactc	cctaatttat	gtgctatata	aatatgtcag	atgtacatag	agatctattt	180
tttctaaaac	attccctctc	ccactcctct	ccacagagt	gctggactgt	tccaggccct	240
ccagtgggct	gatgctggga	cccttaggat	ggggctccca	gctcctttct	cctgtgaatg	300
gaggcagaag	acctccaata	aagtgccttc	tgggcttttt	ctaacccttg	tcttagctac	360
ctgtgtactg	aaatttgggc	ctttggatcg	aatatggtca	agagggt		407

<210> 18

<211> 405

<212> DNA

<213> Homo sapien

<400> 18

tgaagagtca	acttggcct	ggaggactga	taaagtgtgt	gattttgagg	gcctctaaaa	60
gtattaaagc	agcggcagcc	gctgcacgca	gacatgagg	ctagggttaa	acagtaagat	120
caagttgttt	ggacagaaag	gctacagagt	gtggctcctg	ctcttggtga	agaattacga	180
ccacgctaac	catgcctagg	aaggaaagga	gttattgttt	tgtagaaagg	tgctgggggt	240
tgagagatca	gtcggacacg	attggcaggg	agagcacgtg	tgtttttatg	agaattatgc	300
ccgagatagg	taacagatga	ggaagaaatt	tgggcttgat	tgaagtaatg	ggggctgtct	360
gtgaagcttt	gcagcagtag	agcctaggta	atttgctgag	cctaa		405

<210> 19

<211> 401

<212> DNA

<213> Homo sapien

<400> 19

tcctgacatt	cctgccttct	tatattaata	agacaaataa	aacaaaatag	tgttgaagtg	60
ttggggcagc	gaaaat	gggggtggt	atggagagat	aatgggcgat	gtttctcagg	120
gctgcttcaa	gcgggattag	gggcggcgtg	ggagcctaga	gtgggagaga	ttaagctgaa	180
gggaggtctt	gtggtaagg	gtgatatcat	gggatgtta	gaagaaacat	ttgtcgtata	240
gaatgattgg	tgatggcctg	gatacggttt	tggatgattt	gagaagctaa	atggaagata	300
caaggtccga	ataaaaggag	gagaaaaatg	ggtattaaat	gtctaagaat	tgggaggacc	360
taggacatct	gattagagag	tgccctaagg	gattcagcat	a		401

<210> 20

<211> 331

<212> DNA

<213> Homo sapien

<400> 20

aggtccagct ctgtctcata cttgactcta aagtcacag cagcaagacg ggcattgtca	60
atctgcagaa cgatgcgggc attgtccaca gtatttgca agatctgagc cctcaggtcc	120
tcgatgatct tgaagtaatg gctccagtct ctgacctggg gtcccttctt ctccaagtgc	180
tcccggattt tgctctccag cctccggttc tcgggtctca ggctcctcac tctgtccagg	240
taagaggcca ggcggtcggt caggctttgc atgggtctct tctcgttctg gatgcctccc	300
attcctgccg gacccccggc tatcccggtg g	331

<210> 21

<211> 346

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(346)

<223> n = A,T,C or G

<400> 21

ggtcaccac ctgtaccga tatggacttc .cggtctctct gtccaatgga gccacactaa	60
agatctcacc agtcacgtgg tcaattttaa gccaacctct tgtgtctccc ctcagtgaat	120
agcttatgtc cagaccttct ggatccttgg cagtcacatt gccacttta gtgcctatag	180
ctacatcctc actgactttc gcttgaata cgtgttggga aaattgaggt gcttcattca	240
catctgtcac aataagncgt gaacttggca aaagaacttg cattgtactt cacaccaaac	300
actagaggct caggattttc tgctttgaac acaatgttgg aaacag	346

<210> 22

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 22

gaagactccc tctctcgga gccggatccc gagccgggca ggatggatca ccaccagccg	60
gggactgggc gctaccaggt gcttcttaat gaagaggata actcagaatc atcggctata	120
gagcagccac ctacttcaaa cccagcacc gcagattgtg caggctgcgt cttcagcacc	180
agcacttgaa actgactctt ccctccacc atatagtagt attactggtg gaagtaccta	240
caacttcaga tacagaagtt tacggtgagt tttatcccgt gccacctccc tatagcgttg	300
ctacctctct tcctacnwa cgatgaaagc tgagaaggct aaagctgctg caatggcatg	360

<210> 23

<211> 251

<212> DNA

<213> Homo sapien

<400> 23

ggcggagctc cacgacgagc tggaaaagga accttttgag gatggctttg caaatgggga	60
agaaagtact ccaaccagag atgctgtggt cacgtatact gcagaaagta aaggagtcgt	120

```

gaagtttggc tggatcaagg gtgtattagt acgttgtatg ttaaaccattt ggggtgtgat 180
gcttttcatt agattgtcat ggattgtggg tcaagctgga ataggctctat cagtccttgt 240
aataatgatg g 251

```

<210> 24

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 24

```

caggtctttc ccagtggttg actccagctc cagcttcagc tccagctcca ggtcgggctc 60
cagctccagc cgcagcttar gcagcgggag gttctgtgtc ccagttgttt tccaatttca 120
ccggctcccg tggatgamcg ygggacctgy caswgctcct gtktycctgc yagsacacca 180
cnytttyccg tggacacrar kggaacckct tggaattcac agctyatgtt ctttctcara 240
agtttgagaa agaactttct aaagtgaggg aatatgtcca attaattagt gtgtatgaaa 300
agaaactgtt aaacctaact gtccgaattg acatcatgga raaaggatac catttcttac 360
actgaactgg acttcgagct gatcaaggta gaagtgaagg agatggaaaa actggtcata 420
c 421

```

<210> 25

<211> 381

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 25

```

gaactttttg tttctttatt ttcaatattt gtcttattaa tatttttctt attttataat 60
gcaattacaa caatttagga nacaaaacaa tataaacaaa agaattgttaa atagtttttt 120
ttaaaaaata gcttggtgct tgcaanaaag tccatataat cttattcccc cccaaatata 180
attttatact ttgactataa ccaaaatagc ttatggaaaa ttagtattaa atagctaaac 240
acagaaaacc tacagctata aataacataa aatacagttt aactttaatg ngatgcttaa 300
acaaagcaaa ctatgatgca atatgaatca acttcattaa ttggacaagt ccagnggagg 360
cacaaattag ataagcacta a 381

```

<210> 26

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 26

```

ggaaaaggga ctggcctctc tgaagagtga gatgagggaa gtggaaggag agctggaaaag 60

```

```

gaaggagctg gagtttgaca cgaatatgga tgcagtacag atggtgatta cagaagccca 120
gaaggttgat accagaagcc aagaacgctg gggttacaat ccaagacaca ctcaacacat 180
tagacgggct cctgcattct gatggaccaa ccttttcang tggtaagatt gaagangggg 240
cctgggctta cctgggaagc aaaaactttt cccganccaa ggaaccacag attcaaccan 300
gcnacttgcg ggccaaggaa ggcanaactn ggaanaaaag gccccttaag caaaagggnc 360
accttcattt gctnggaaan cagcctttan ttggaatctt g 401

```

<210> 27

<211> 383

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 27

```

aattgcaact ggacttttat tgggcagtta cnacaacnaa tgttttcana aaaatatttg 60
gaaaaaata accacttcat agctaagtct tacagagaan aggatttgct aataaaactt 120
aagttttgaa aattaagatg cnggtanagc ttctgaacta atgcccacag ctccaaggaa 180
necatgtcct atttagttat tcaaatacca gttgagggca ttgtgattaa gcaaacaata 240
tatttgttan aactttgntt ttaaattact gntncttgac attacttata aaggagnctc 300
taactttcga tttctaaaac tatgtaatac aaaagtatan ntttcccat tttgataaaa 360
gggccnanga tactgantag gaa 383

```

<210> 28

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 28

```

ggtcgcgttt cccctggctc acagtctgcc attatttgca tttttaaatg aagaaaagtt 60
taacgtggat ggatggacag tttacaatcc agtggaagaa tacaggaggc agggcttgcc 120
caatcaccat tggagaataa cttttattaa taagtgtcat gagctctgcg acacttaccc 180
tgctcttttg gtggttccgt atcgtgcttc anatgatgac ctccggagag ttgcaacttt 240
taggtcccga aatcgaattc cagtgtgtgc atggattcat ccagaaaata agacgggtcat 300
tgtgcgttgc agtcagcctc ttgtcggtat gagtgggaaa cgaaataaag atgatgagaa 360
atatctcgat gttatcaggg agactaataa acaaatttct a 401

```

<210> 29

<211> 401

<212> DNA

<213> Homo sapien

<400> 29

```

atatgagttt gccatctcca tggatgccat ttcaatgcct tcagggtaat cattctctcc 60
ccaaagactg cccacgggt catcactcct gtgacgaaat gagggctgga ttgaagatgt 120
tctgctgagc acccccctgg tcatctttgg ggtctcagaa gagccataat catgaccatt 180
ctcagcatct gaataatcag gttctctcca agtgcttggc aagttctgat tgcctcagc 240

```

actgggatag tctggctccc caaaaaaggg tggagagtta ggttgaatgt cagcgcctgg	300
ataatcaggc tttcccagag agtctgcgta tggattgatt ctaaaacttg tatgttccag	360
attctttctg gatcctggat ggttcaaatt ggctctgggt c	401

<210> 30
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 30	
cctgaactat ttattaaaaa catgaccact cttggctatt gaagatgctg cctgtatttg	60
agagactgcc atacataata tatgacttcc tagggatctg aaatccataa actaagagaa	120
actgtgtata gcttacctga acaggaatcc ttactgatat ttatagaaca gttgatttcc	180
cccatcccca gtttatggat atgctgcttt aaacttggaa gggggagaca ggaagtttta	240
attgttctga ctaaacttag gagttgagct aggagtgcgt tcatggtttc ttcactaaca	300
gaggaattat gctttgcact acgtccctcc aagtgaagac agactgtttt agacagactt	360
tttaaaatgg tgccctacca ttgacacatg cagaaattgg t	401

<210> 31
 <211> 297
 <212> DNA
 <213> Homo sapien

<400> 31	
acctccatta atgccaggtg ttctctctct gatgccagga atgccaccag ttatgccagg	60
catgccacct ggattgcatc atcagagaaa atacaccag tcattttgcg gtgaaaacat	120
aatgatgcca atgggtggaa tgatgccacc tggaccagga ataccacctc tgatgcctgg	180
aatgccacca ggtatgcccc cacctgttcc acgtcctgga attcctccaa tgactcaagc	240
acaggctgtt tcagcgccag gtattcttaa tagaccacct gcaccaacag caactgt	297

<210> 32
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 32	
caaacttggg gccaaaaagg acacaaagga ctctcgaccc aaactgcccc agaccctctc	60
cagaggttgg ggtgaccaac tcatctggac tcagacatat gaagaagctc tatataaatc	120
caagacaagc aacaaacctt tgatgattat tcatcacttg ggtgagtgcc cacacagtca	180
agctttaaag aaagtgtttg ctgaaaataa agaaatccag aaattggcag agcagtttgt	240
cctcctcaat ctggtttatg aaacaactga caaacacctt tctcctgatg gccagtatgt	300
ccccaggatt atgtttgttg acccatctct gacagttaga gcccgatatc actggaagat	360
attcaaaccg tctctatgct tacgaacctg cagatacagc t	401

<210> 33
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 33	
agcagagggg caggaatcat tcggccactg ttcagacggg agccacaccc ttctccaatc	60
caagcctggc cccagaagat cacaaagagc caaagaaact ggcaggtgtc cacgcgtccc	120
aggccagtga gttggttgtc acttactttt tctgtgggga agaaattcca taccggagga	180
tgctgaaggc tcagagcttg accctgggcc actttaaaga gcagctcagc aaaaggggaa	240
attataggta ttacttcaaa aaagcaagcg atgagtttgc ctgtggagcg gtgtttgagg	300

agatctggga ggatgagacg gtgctcccg tgtatgaagg ccggattctg ggcaaagtgg 360
agcggatcga ttgagccctg gggctctggct ttgggtgaact g 401

<210> 34
<211> 401
<212> DNA
<213> Homo sapien

<400> 34
aacaatggct atgaaggcat tgtcgttgca atcgacccca atgtgccaga agatgaaaca 60
ctcattcaac aaataaagga catgggtgacc caggcatctc tgtatctggt tgaagctaca 120
ggaaagcgat tttatttcaa aaatgttgcc attttgattc ctgaaacatg gaagacaaag 180
gctgactatg tgagacccaa acttgagacc taaaaaatg ctgatgttct ggttgcttga 240
gtctactcct ccaggtaatg atgaacccta cactgagcag atggggcaac tgtggagaga 300
aggggtgaaa ggatcccacc tcaactcctga tttcattgca ggaaaaaagt tagcttgaat 360
atggaccaca aggtaagggc atttgtccat gaatggggct c 401

<210> 35
<211> 401
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

<400> 35
catttcttcc tactagactg ccccttctgat ccactggcag aaatgatggc accaccttgt 60
cttcagggtg tgctccttca ttattccaag gatgcagcat ctctatgggt ccaggatatg 120
gggtaaagcc tttggcgccc ttcccgcaat ggcacatcag cagtaaaagt ggtaccaata 180
gcangaacag aaagggcaaa atcatgancg caattgctgc gggccccaaag ccacataggt 240
aatcatgctg ngcttccctg canccgctgc catgcaagac actnacaaac tngantgta 300
aggacctgct tttcaggaca actaaaacc tgattgnctg aaatcaggaa ctgaatttca 360
cttctcccaa gctttttctc acttttggtgc aacancacac t 401

<210> 36
<211> 401
<212> DNA
<213> Homo sapien

<400> 36
cctgctagaa tcaactgccg tgtgctttcg tggaaatgac agttccttgt tttttttgtt 60
tctgtttttg ttttacatta gtcattggac cacagccatt caggaactac ccctgcccc 120
acaaagaaat gaacagttgt agggagaccc agcagcacct ttctccaca caccttcatt 180
ttgaagtctg ggtttttgtg ttaagttaat ctgtacattc tgtttgccat tgttacttgt 240
actatacatc tgtatatagt gtacggcaaa agagtattaa tccactatct ctagtgttg 300
actttaaatc agtacagtac ctgtacctgc acgggtcacc gctccgtgtg tcgccctata 360
ttgagggtctc aagctttccc ttgttttttg aaaggggttt a 401

<210> 37
<211> 401
<212> DNA
<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (401)
 <223> n = A,T,C or G

<400> 37
 cnnctntgna atggantnnt tgnctaaaaan ganttgatga tgatgaanat ccctangang 60
 antaagcatg gancntgac nttnctnng cactccttta cgacacggaa acangnatca 120
 ncatgatggt accaganacc ttatcaccna cgcgcacnga nctgactnat tccaaagagt 180
 tngnggttacg gncatccggt cattgctcgt gccattgct gcagggctga tinctactggt 240
 gcttattatg ntggccctga ggatgctcca caatgaatat aagcatgctg catgatcagc 300
 ggcaacanat gctctgccgt ttgcactaca tctttcacgg acacnatntc gaanacgggc 360
 acnttgcana gttagacttg gaatgcatgg ngccggnan n 401

<210> 38
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 38
 aattggctca ctctctcaag gcaagcactg tctcaaggca gtctcaaggc agagatgaca 60
 cagcaaaaaa cagaggggga gaaaaaagtc tattattggc ttgtgattta caaaagccaa 120
 agtccttttag ataaaaggcc aggagtcgta ccaacataga taccaaatcc aggagaacac 180
 agaccagcga taagagggac gcttccccat gaccagacc agcctaaagc ccctgtgggg 240
 gcagccagt gggagctgtc agaccttgga catggtggtc ttgagaatg ggtctgccct 300
 tctctccctg accagttggg atagacacct gactggaatc cttgacactg gcaggtgttt 360
 ctatgaacag agaggactgt gcctgtcttc ctgaatccca a 401

<210> 39
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (401)
 <223> n = A,T,C or G

<400> 39
 tctggtangg agcaattcta ttatttgga ttgcatggct gggttgaatt aaaacagggga 60
 gtgagaacag gtgagtctag aagtccaact ctgaaaagga ccactgtaca tttgaacaca 120
 cggctgtgtt aaagatgctg ctaatgtcag tcaactgggtg cactaaagga tctcttattt 180
 tatgtaaaac gttgggaatg acaagatana actgatactc tggtaaagta ccctctgaag 240
 ctacttcttg tgaaatacta atgacagcat catcctgcca agcgaaagag gcaggcataa 300
 gcaaggacaa attaaaaggg ggtaagagcc ttatcatgat gaggagtctt gttttgacat 360
 cttgggaaaa gctgtccata gtgtgaagtc gtcaatttct c 401

<210> 40
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 40
 tctggtcacc caactcttgt ggaagagggg aattgagatc gagtactgaa tatctggcag 60
 agaggctgga atccttcagc cccagagccc agggaccact ccagtagatg cagagagggg 120

```

cctgcccagg ggtcagggca gtgggtatca ctggtgacat caagaatata agggctgggg 180
aggcatcttt gtttcctggt gccctcctca aagttgctga cactttgggg acgggaaggg 240
gtagaagtag ggctgtcctt tttggagctg gagggaaatag acctggagac agagttgagg 300
cagtcgggct gtccagggtc taagcatcac agcttctgca ctgggctctg aggagattct 360
cagccagagg atcccagcct ctcctcctc caaatgtcaa g 401

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<210> 41
<211> 401
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 41
ctggactaaa aatgtccact atggggtgca ctctacagtt tttgaaatgc taggaggcag 60
aaggggcaga gagtaaaaaa catgacctgg tagaaggaa agaggcaaag gaaactaggt 120
ggggaggatc aattagagag gaggcacctg ggatccacct tcttccttan gtcccctcct 180
ccatcagcaa aggagcactt ctctaatacat gccctcccga agactggctg ggagaagggt 240
taaaaaacaaa aaatccagga gtaagagcct taggtcagtt tgaaattgga gacaaactgt 300
ctggcaaagg gtgcganagg gagcttgtgc tcangagtcc agcccgtcca gcctcggggt 360
gtangtttct gaagtgtgcc attggggcct cactttctct g 401

```

```

<210> 42
<211> 310
<212> DNA
<213> Homo sapien

```

```

<400> 42
ggttcgacaa atccccaaaa atggcaaatt aagccctgtg acaaaataag ttattggatc 60
atacagaaat agcccaaatc tggaaathtt gaattaaaat tgtaatcctg taaaacaagt 120
tttggggtga atggatttct ttaataccaa taatatTTTT aattcccacc acagatggat 180
ttgctgaata tgctaatagt gtgaatgaga aaacaatttt ggggtaggta taccacaag 240
taatctgatg acaaaataaaa ccacagactg atgtcaaatg gacaaaaaac tgaaaatatg 300
ctgtgagaaa 310

```

```

<210> 43
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 43
aggtcactta cacttgtgac cagtgtgggg cagagaccta ccagccgatc cagtctccca 60
ctttcatgcc tctgatcatg tgcccaagcc aggagtgcc aaccaaccgc tcaggagggc 120
ggctgtatct gcagacacgg ggctccagat tcatcaaatt ccaggagatg aagatgcaag 180
aacatagtga tcagggtgct gtgggaaata tccctcgtag tatcacggtg ctggtagaag 240
gagagaacac aaggattgcc cagcctggag accacgtcag cgtcactggg attttcttgc 300
caatcctgcg cactgggttc cgacaggtgg tacagggttt actctcagaa acctacctgg 360
aagcccatcg gattgtgaag atgaacaaga gtgaggatga t 401

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```

<210> 44
<211> 401
<212> DNA

```

<213> Homo sapien

<400> 44

atccctgtaa	gtctattaaa	tgtaaataat	acatacttta	caacttctct	tagtcggccc	60
ttggcagatt	aaatctttgc	aaaattccat	atgtgctatt	gaaaaatgaa	ataaaacctc	120
agatgtctga	attcttattt	caaatacagt	tatataatta	ttttaaatta	caatatacaa	180
tttctgttaa	atacaactgt	taagggattc	tgagaacaat	tataagatta	taataatata	240
tacaaactaa	cttctgaaat	gacatgggtt	gtttccttcc	cacctccta	ccctctcaaa	300
gagtttttgc	atttctgtgt	cctgggtgca	aaaggcaaaa	gaaaatctaa	aaatagtctg	360
tgtgtgtcca	cgacatgctc	gctcctttga	gaatctcaaa	c		401

<210> 45

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 45

gtgcctgctg	cctggcagcc	tggccctgcc	gctgcctcag	gaggcgggag	gcatgagtga	60
gctacagtgg	gaacaggctc	aggactatct	caagagattt	tatctctatg	actcagaaac	120
aaaaaatgcc	aacagtttag	aagccaaact	caaggagatg	caaaaaattc	tttggcctac	180
ctatactgga	atggtaaact	cccgcgtcat	anaaataatg	caanaagccc	agatgtggag	240
tgccagatgt	tgcaagaatac	tcactatttc	caaataagccc	aaaatggact	tccaaagtgg	300
tcacctacag	gacgttatca	tatactcgag	acttaccgca	tattacagtg	gacgattag	360
tgtcaaaggc	tttaaaccatg	tggggcaaaag	agatccccct	g		401

<210> 46

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 46

gtcagaattg	tctttctgaa	aggaagcact	cggaatcctt	ccgaactttc	caagtcctac	60
catgattcan	agatactgcc	ttctctctct	ctgggatttt	atgtgtttct	gatagtgaat	120
tgttgatgta	tttgctactt	tgcttctttt	ctctttcaag	acttgatcat	tttatatgct	180
gnttggagaa	aaaaagaact	tttggtagca	aggaggtttc	aagaaatgat	tttggatttt	240
ctgctcgga	atttctcggc	acctacctgt	agtatggggc	acttggtttg	gttgcagagt	300
aagaaggttg	aagaatgagc	tgtacttggg	taagcagttg	aaaccttttt	tgagcaggat	360
ctgtaaaagc	ataattgaat	ttgtttcacc	cccgtggatt	c		401

<210> 47

<211> 401

<212> DNA

<213> Homo sapien

<400> 47

<211> 236
 <212> DNA
 <213> Homo sapien

<400> 51
 cgtctcgaag aagcgcgtgca ggccgatgat ggactgcaag tctgccttgt cctcagttaa 60
 cttgttgaat tgcttgaaca tgcggccac atcctgggca aactcctgtg gggagctgta 120
 gggaggtgac aacttctcct ggaggcgggc acggatcagg gtcagatcca gggtgccacc 180
 gggctggtcc agggagaagg tggagtcgta gccagacctg cccgggcggc cgctcg 236

<210> 52
 <211> 291
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(291)
 <223> n = A,T,C or G

<400> 52
 ctcacatcct gggtcgggt gtagagctgc accatggtgc tgagcgcccc ctccagctcc 60
 ttgtagatgt aaaggacggc gaaggagctg tagtctgtgt ccacgatgcg cacgtccagg 120
 tagcccaagg ccgggactct gaagtgtgcc ctcgagccc accttcangt actcgggcat 180
 ccacctggtt acagccttgc gncctcggna actccatntg gactttacag gccgccctcc 240
 tctgtgggcc tgatggncct tgcaggacat nggaacacgg gagctcnctt t 291

<210> 53
 <211> 95
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(95)
 <223> n = A,T,C or G

<400> 53
 gtctgtgcag tttctgacac ttgttgttga acatggntaa atacaatggg tctcgtgan 60
 cactaagttg tanaanttaa caaatgtgct gnttg 95

<210> 54
 <211> 66
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(66)
 <223> n = A,T,C or G

<400> 54
 cctnaatnat ntnaatggta tcaatnccc tgaangangg gancggngga agccggnttt 60
 gtccgg 66

<210> 55
 <211> 265
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(265)
 <223> n = A,T,C or G

<400> 55
 atctttcttc tcagtgcctt ggcctgttg agtctatctg gtaacactgg agctgactcc 60
 ctgggaagag aggccaaatg ttacaatgaa cttaatggat gcaccaagat atatgaccct 120
 gtctgtggga ctgatggaaa tacttatccc aatgaatgcc gtgttatgtt ttgaaaatc 180
 ggaaacgcca gacttctatc ctcatcaca aatctgggcc ttctgaaaa ccagggtttt 240
 naaaatccca ttctggctcnc cggcg 265

<210> 56
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(420)
 <223> n = A,T,C or G

<400> 56
 gagcgccgc ccgggcaggt cctcgcggtg acctgatggg atttcaaac cttggttctc 60
 agcaaggccc agatttttga atgangatag aagtctggcg ttctcgattt tcaaacata 120
 acacgcattc attgggataa gtatttccat cagtcacaca gacngggica tatatcttgg 180
 gtgcattcat taagtctcct tgtaaacatt tgggcctctc ttctccangg gaattcagct 240
 cccagttgtt taccaanatt naactccacc ggggccaaag gcncttgaaa aaaaaanaa 300
 ttcttctgtt accttccttg ggcttnaagt tctggcgctc aaaagttcaa ttgaaaact 360
 gcaccgcact taccacgtct cttcnagaan cctggggaca cctcgycgc gaccacgcta 420

<210> 57
 <211> 170
 <212> DNA
 <213> Homo sapien

<400> 57
 gaagcggagt tgcagcgctt ggtggccgcc gagcagcaga aggcgcagtt tactgcacag 60
 gtgcatcact tcatggagtt atgttgggat aaatgtgtgg agaagccagg gaatcgcta 120
 gactctcgca ctgaaaattg tctctccaga cctcgccgc gaccacgcta 170

<210> 58
 <211> 193
 <212> DNA
 <213> Homo sapien

<400> 58
 attttcagtg cgagagtcta ggcgattccc tggcttctcc acacatttat cccaacataa 60
 ctccatgaag tgatgcacct gtgcagtaaa ctgcgccttc tgctgctcgg cggccaccag 120
 gcgctgcaac tccgcttcat cggcttcgcc cagctccgcc attgttcgcc acctgcccgg 180

gcggccgctc gaa

193

<210> 59

<211> 229

<212> DNA

<213> Homo sapien

<400> 59

cgcaactctc	gagcatttat	atacaatagc	aaatcatcca	gtgtgttgta	cagtctataa	60
tactccaaca	gtctcccatc	tgtattcaat	ggcgccaccc	aatacagtc	tttgtttga	120
tgctggggag	agtaatccct	acccaagca	ccatatagat	aagaaaacc	tctccagttg	180
agctgaacca	cagacggttt	gctgatacct	gcccggcgcg	ccgctcgaa		229

<210> 60

<211> 340

<212> DNA

<213> Homo sapien

<400> 60

tcgagcggcc	gcccgggcag	gtcctctaaa	gatcaaaaaca	ccctgtcgt	ccaccctcct	60
cccactccag	ggaagctgtg	gtcatgggtg	tgtggtgaac	atcagcaaac	cgtctgtggt	120
tcagctcaac	tggagagggg	tttcttatct	atatggtgct	tggggtaggg	attactctcc	180
ccagcatcca	aacaaaggac	tgtattgggt	ggcgccattg	aatacagatg	ggaaactgtt	240
ggagtattat	aaactggtac	aacacactgg	atgatttget	attgtatata	aatgctcgag	300
aattgcggat	cacctatgga	cctcgccgcg	gaccacgctg			340

<210> 61

<211> 179

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(179)

<223> n = A,T,C or G

<400> 61

tttttgtgac	ggacgnttgg	agtacatgtc	ccaggatcac	atccagcagc	tagagtggct	60
gggacaagct	ggcgngggcc	aagcactgtt	gaaacnatag	gggtctgggn	gnactcgggt	120
tnaagtgggt	ggcccgantn	ttnataacct	tgtcngaacc	nancatctcg	gttgncang	179

<210> 62

<211> 78

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(78)

<223> n = A,T,C or G

<400> 62

agggcggttcg	taacgggaat	gccgaagcgt	gggaaaaagg	gagcggtggc	nggaagacgg	60
ggatgagctt	angacaga					78

<210> 63
 <211> 410
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(410)
 <223> n = A,T,C or G

<400> 63
 cccagttact tggggagggt gaggcagga gaatcctttg aacccggngg gtgggaggtt 60
 gcagtgaagg cgagatagca ccattgcact tccancatgg ggtggacaga gtgagactct 120
 atctcaaaaa aaaagaaaag aaaaggaaa agattagatt aagattaagt acctacttcc 180
 tntcccattt caagtctga aatagagga tcagaaatgt tgaggaattc tttaggatag 240
 aaagggagat gggattttac ttatggggaa agaccgcaa taaagactgn aacttaacca 300
 cattcccaa gtgnaagggt ttaccaaga agtaggaacc cttttggctn ttaccttacc 360
 ttcngaaaa aaacttattn cttaaaatgg aaacccttaa agcccgggca 410

<210> 64
 <211> 199
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(199)
 <223> n = A,T,C or G

<400> 64
 cttgttctca aaaagggtcaa agggagcccg acgaggaata aatagcaatg ccttgaattc 60
 caactgacct tctacagaaa agtgcttgac tgccaagtgg tcttcccagt cattagttag 120
 gctctttag aattctccat actcctcttg gngangnca tnagggtttn nggcccacat 180
 aggntgggcc tngttaagt 199

<210> 65
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 65
 agcggtagag ttctgtcctg gcatcatcat tcattgtagt atggtcaata ggtgccatga 60
 aactcagtag cttgctaagg acatgaaacc gaagtttctt gcctttgctg gcctngtngn 120
 gggtgta 125

<210> 66
 <211> 204
 <212> DNA
 <213> Homo sapien

<400> 66
 attcagaatt ctggcatcgg tattttctata aagtccatca gttagagcag gagcaggccc 60
 ggagggacgc cctgaagcag cgggcggaac agagcatctc tgaagagccc ggctgggagg 120
 aggaggaaga ggagctcatg ggcatttcac ccatatctcc aaaagaggca aaggttcctg 180
 tggacctcgg ccgcgaccac gcta 204

<210> 67
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (383)
 <223> n = A,T,C or G

<400> 67
 tcagggcctc caggcagcca gttttgcagg anattcagca cctagngtct tcctgcctna 60
 cgctcccaag aacctgctcc tgcaggggga acatcagaac tcgtccttga tgtcaaaatg 120
 gggctggtct tnaggcttga agtccagggt agggctgcca tcctcattga gaattctccg 180
 ggcagtgtan ccgacgatgg ggtatttggc tttgtacact ttggtgaaaa cctnatccag 240
 ggctccagtc tccttggccg tganaccgt antgtcatgg gtgaggtctg caggatccaa 300
 ggacatcttg gtaaccctc tagtggagtc cttcccgcgc aaggcattgt aaggggctcc 360
 tcgtccataa aactcctttt cgg 383

<210> 68
 <211> 99
 <212> DNA
 <213> Homo sapien

<400> 68
 tcacatctcc tttttttttt aactttttca aatttttgtg ttaaatagaa ggctaaaggg 60
 ttagatttaa gtttctgcta cattgacctt atttaccta 99

<210> 69
 <211> 37
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (37)
 <223> n = A,T,C or G

<400> 69
 gagaaggacn tacggnctg ntantanang aatctcc 37

<210> 70
 <211> 222
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (222)

<223> n = A,T,C or G

<400> 70

gtgggtcatt	tttgctgtca	ccagcaacgt	tgccacgacg	aacatccttg	acagacacat	60
tcttgacatt	gaagcccaca	ttgtccccag	gaagagcttc	actcaaagct	tcatggcgca	120
tttcgacaga	ttttacttcc	gttgtaacgt	tgactggagc	aaaggtgacc	accataaccg	180
gtttgagaac	accantcac	ctgccccggg	cggccgctcg	aa		222

<210> 71

<211> 428

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(428)

<223> n = A,T,C or G

<400> 71

caggagtatt	ttgtagaaaa	gccagaagag	cattagtaga	tgtatggaaa	tatacggtag	60
ggcacacgct	gacagtactt	ttcccaagcc	acgccgtatt	tcttcttaca	gtggtactcg	120
tcacgagctt	ctcgggtggac	aagcaacatg	gtgaaataaa	ttatgtagaa	ataaggcaga	180
atgtggttaa	aaccacatgg	gagggaccac	gccaaaggcca	tgatgagatc	acccaagtaa	240
ttggggtggc	gaacaaagcc	ccaccatcca	gaaactagaa	naatttttcc	cgttgaaata	300
tgaatggnnt	ttaaattgtc	aagcttttga	tcactgggaa	ttttcccgaa	tgccttttcc	360
tganaattgc	accttnggaa	gantccttac	cccaagnttc	agaccattat	ttnaaaagcn	420
ttggaact						428

<210> 72

<211> 264

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 72

gaataaagag	cttactggaa	tccagcaggg	ttttctgccc	aaggatttgc	aagctgaagc	60
tctctgcaaa	cttgatagga	gagtaaaaag	ccacaataga	gcagtttatg	aagatcttgg	120
aggagattga	cacacttgat	cctgccagaa	aatttcaaag	acagtagatt	gaaaaggaaa	180
ggcctttggt	aaaaaaggtt	caggcattcc	tagccgantg	tgacacagtg	gagcanaaca	240
tctgcangag	actgancggc	tgca				264

<210> 73

<211> 442

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(442)

<223> n = A,T,C or G

<400> 73

ggcgaaatccg	gcggggtatca	gagccatcag	aaccgccacc	atgacgggtgg	gcaagagcag	60
caagatgctg	cagcatattg	attacaggat	gaggtgcatc	ctgcaggacg	gccggatctt	120
cattggcacc	ttcaaggctt	ttgacaagca	catgaatttg	atcctctgtg	actgtgatga	180
gttcagaaag	atcaagccaa	agaacttcaa	acaagcagaa	agggaagaga	agcgagtcct	240
cggctctgng	ctgctgccaa	gggagaatct	ggtctcaatg	acngtagaag	gaccttcttc	300
caaagatact	ggnattgctc	gagttccact	tgctggaact	tcccggggcc	caaggatcgc	360
aaggcttctg	gcaaaagaaa	tccanacttn	ggccggggacc	acctaanca	attcacacac	420
tggcggccgt	actagtggat	cc				442

<210> 74

<211> 337

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(337)

<223> n = A,T,C or G

<400> 74

ggtagcagcg	tctccagagc	ctgatctggg	gtcccagata	cccaggcagc	agcagccctg	60
gaggtaaaag	gcaagctccc	caatgtgagg	ggagacccca	ttcctggtea	gccaggcttt	120
cagaggagat	agcaggctga	gggagccaac	gaagaagaga	ctgccancag	gggaaggact	180
gtcccgccaa	ggacagaact	gattcagggg	ggtcaatgct	cctctagaga	agagccacac	240
agaactgggg	ggtccaggaa	ccatgaanct	tggctgtggt	ctaaggagcc	aggaatctgg	300
acagtgttct	gggtcatacc	aggattctgg	aattgta			337

<210> 75

<211> 588

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 75

catgatgagt	tctgagctac	ggaggaaccc	tcatttcctc	aaaagtaatt	tattttttaca	60
gcttctggtt	tcacatgaaa	ttgtttgcgc	tactgagact	gttactacaa	actttttaag	120
acatgaaaag	gcgtaatgaa	aaccatcccg	tccccattcc	tcctcctctc	tgagggactg	180
gagggaaagc	gtgcttctga	ggaacaactc	taattagtag	acttgtgttt	gtagatttac	240
actttgtatt	atgtattaac	atggcgtggt	tatttttgta	tttttctctg	gttgggagta	300
tgatatgaag	gatcaagatc	ctcaactcac	acatgtagac	aaacattagc	tctttactct	360
ttctcaaccc	ctttttatgat	tttaataatt	ctcacttaac	taatttttgta	agcctgagat	420
caataagaaa	tgttcaggag	agangaaaga	aaaaaaatat	atgttcccca	tttatattta	480
gagagagacc	cttantcttg	cctgcaaaaa	gtccaccttt	catagtagta	ngggccacat	540
attacattca	gttgctatag	gncagcactg	aactgcatta	cctggggca		588

<210> 76

<211> 196

<212> DNA

<213> Homo sapien

<400> 76
 gcggtatcac agcctggccc ccatgtacta tcggggggcc caggctgcca tcgtgggtcta 60
 tgacatcacc aacacagata cattttgcacg ggccaagaac tgggtgaagg agctacagag 120
 gcaggccagc cccaacatcg tcattgcact cgcgggtaac aaggcagacc tggacctgcc 180
 cgggcggccg ctcgaa 196

<210> 77
 <211> 458
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(458)
 <223> n = A,T,C or G

<400> 77
 agtagagatg gggtttcact gtgttaacca ggatgggtctt gatctcctgg cctcgtgatc 60
 tgcccgcctc ggcctcccaa agtgttggga ttacaggcgt gaaccaccgc acccggccag 120
 aaatggttagt ttttccctat tctctctcct ttttcttatt atatacttgg tcaaccagac 180
 agccatccta cccanaatg gtaatgcctc ttcattcctc atatgaggga ataaaagaga 240
 aaaaagcttt tggaaaacat ccacttatct aatcatccca aatatgtaat caaaagtata 300
 caactcatgt gaagaatata ctggtaaaat gttantatag gccaaaggat cttgaattcc 360
 tatatagaaa gctggttaa ggccttttgg ctggaaccgc catcttcnn taattcnccc 420
 aaaatgacca aacacaaagg gnaagangan aagcccc 458

<210> 78
 <211> 464
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(464)
 <223> n = A,T,C or G

<400> 78
 tccgcaaatt tcctgccggc aagggtcccag catttgaggg tgatgatgga ttctgtgtgt 60
 ttgagagcaa cgccattgcc tactatgtga gcaatgagga gctgcgggga agtactccag 120
 aggcagcagc ccagggtggtg cagtgggtga gctttgctga ttccgatata gtgccccag 180
 ccagtacctg ggtgttcccc accttgggca tcatgcacca caacaaacag gccactgaga 240
 atgcaaagga ggaagtgagg cgaattctgg ggctgctgga tgcttacttg aagacgagga 300
 cttttctggt gggcgaacga gtgacattgg ctgacatcac agttgtctgc accctgttgt 360
 ggctctataa gcaggntcta gaaccttctt ttcgcangac cttcggccgg accacgctta 420
 acccaaattc cacacacttg cnggccgtac taanggaatc ccac 464

<210> 79
 <211> 380
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(380)
 <223> n = A,T,C or G

<400> 79
ctgtatgacc agttttttcca tctccttcac ttctaccttg atcagctcga agtccagttc 60
agtgtgaagaa atgggtatcct tctccatgat gtcaattcgg acagttaggt ttaacagttt 120
cttttcatac aactaatta attggacata ttccctcact ttanaaagtt cttttctcaaa 180
cttctganaa aagaacatga actgtgaatt ccaagcggtc ccactctgtc cacgggaaaa 240
gggtgtgtct ggcagggaaa cagaacactg gcaggtccac ggtcatccac ggagccgggtg 300
aaattgggaa aacaactggg acacagaacc tccgtgcctt aagctgcggn tgggagcttg 360
gaacccgacc tggaactgga

<210> 80
<211> 360
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (360)
<223> n = A,T,C or G

<400> 80
tcgagcggcc gcccgggcag gtcctcagag agctgtttgt tncgcttctt caaaaactcc 60
tattctccac ttctgctaaa ggactggatg acatcaattg tgatagcaat atttgtgggt 120
gttctgtcan ncancatcgc actcctgaac aaagtagatg ttggattgga tcagtctctt 180
tccaccacaga tgactcctan atgggtggatn atttcaaate catcantcag tacctgcatg 240
cgnggtccgc ctgtgttctt tgtcctgcag gangggcnct actacacttc ttccnagggg 300
canaacatgg tgtgcngcgg ccatgggctg gcaacantga ttcnctgctg caccanatan 360

<210> 81
<211> 440
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (440)
<223> n = A,T,C or G

<400> 81
acgtgggtcgg gcgagtctga cctgcagata tgaactcctt gggaaacctt cattctgcct 60
cagacatact gggggcaaatt ggcttttaaaa gtctgggtca gggagccaag attacagaaa 120
nccgttgagt cnccatacat ggacactgac aaaggaactg aagatatcca aacaagccct 180
cctgtgcccc ngcctgcata aagatcggga ncggaacggg accngacgtc tgtggtcagg 240
ggttgtggaa aattggaaaa aaccagtcct gccacattg acagggagc ctcaacggaa 300
attgaacaga tngtcttate accagtcctc cctcctggat cntgtctcgg ctcnngggan 360
tcagtgatca gtcctttcag gtggaagaag caaagaagat caacaanaag cngatcctct 420
cacctgntac cagcatatgg

<210> 82
<211> 264
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 82

agcgtggtcg	cggccgangt	cctgacattc	ctgccttctt	atattaatta	tacnaataaa	60
acaaaatagt	gttgaagtgt	tggagcggcg	aaaatttttg	gggggtggta	tggacagaga	120
atgggcgatn	ttctcanggc	tgcttcaagt	gggattgggg	cngcgtggga	tcatncagtg	180
gganagattn	cnctgaccgg	antctnttgg	tanggatnat	cttgtgggga	tgtgcaagag	240
ncattcgtct	cctgaatgan	tggt				264

<210> 83

<211> 410

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(410)

<223> n = A,T,C or G

<400> 83

ancgtggtcg	cggccgangt	ccacagttgt	gggagagcca	gccattgtgg	gggcagctcc	60
acaggttaaga	ctcgtgtcct	gagcagcgca	catcatccag	gacaatgggt	cctgagccct	120
gaccaaaccg	ggcatttctt	ggggctgaca	tggcccagcc	acagcccant	tgcttcgaga	180
cgaattggc	atcattggtg	tcccagtant	catcacacac	ggtgccccag	gaacctccgg	240
tatangaact	ccactcggcc	tcnanacctg	tcgcctccat	tcncagcct	cagggggcaa	300
actgggattc	agatccttct	gtgggtacag	gtgggtgatat	cctgacaggg	caactttctg	360
gcctgagtgt	tgactgangc	tgggcagacc	tgcccggggc	gccgctcgaa		410

<210> 84

<211> 320

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(320)

<223> n = A,T,C or G

<400> 84

tcgaacggcc	gcccgggcag	gtctgcccga	ggtgtatcca	tttgccggcg	atctctatca	60
naaggagctg	gctaccctgc	nncgacgaan	tcttgaanat	aatctcacc	nccagatct	120
ctctgtcgca	atggagatgt	cgtcatcggt	ggnccatgat	acagggcatt	ggactcagag	180
anangtnanc	acagtgtnga	agcgattgan	nnagttcagt	tgctgggtct	acccgatntt	240
ggaagggaag	aaaacgtggt	angacgtatc	tcgatgnant	tgaccaaanc	tgaangctnc	300
agggggcatc	gcaaaganan					320

<210> 85

<211> 218

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(218)

<223> n = A,T,C or G

<400> 85

tcgagcggcc	gcccgggcag	gtctgctgcc	cgtgctggtg	ccattgcccc	atgtgaagtc	60
actgtgccag	cccagaacac	tggctctcggg	cccagagaaga	ctcctttctc	caggctntan	120
gtatcaccac	taaaatctcc	aggggcacca	tnganatcct	gggtgtccgc	aatgttgcca	180
atgtctgtcc	gcnnattggc	tacccaactg	ttgcatca			218

<210> 86

<211> 283

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(283)

<223> n = A,T,C or G

<400> 86

tcgacttctt	gtgaaggttt	tgganaaata	tgtatcagtt	cgtttttattt	gggtattcaa	60
taatatcctt	ggtgataatg	ctgactccat	ggcttctgac	cccaaaaatt	gaccctgctg	120
ccactggttg	tagccctgag	attgattttt	gtagccacga	ttgtttcctc	gtcctctgaa	180
gtnctggttg	tanttccctc	tgtngggcat	tccctctgt	tgtanttccc	tctgtttgan	240
taactaccac	ggccaggaaa	aacaggggca	cgaaggtatg	gat		283

<210> 87

<211> 179

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(179)

<223> n = A,T,C or G

<400> 87

agcgtggtcc	cggccgatgt	ctttctgtgt	aagtgcataa	cactccacat	acttgacatc	60
cttcangtca	cgggccagct	nttcagcant	ctctggagt	ataggctact	gtntgttctn	120
ggcaagtgtc	tcaanaatac	aggggtcntc	tctgagatga	ntttcagtcc	cgaaccctc	179

<210> 88

<211> 512

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(512)

<223> n = A,T,C or G

<400> 88

tcgagcggcc	gcccgggcag	gtcctancan	agaatcacca	aatttatgga	gagttaacag	60
gggtttaaca	ggaangaagt	gccttttagta	agttctcaag	ccagangctg	gaggcagcag	120
ctaaatcaga	ggacaggatc	ctcagtgaaa	gtgagccatt	cgggggtggca	tgctactcca	180
ggaataagca	caacttanaa	acaaatgatt	tcgtangata	gcacagtgc	attggtgcac	240

ttgtgaacct	gaggccactg	tgtcaaactg	tgcactgggt	gtgaataggg	aganccaaaa	300
attatgtcct	actgggtaat	gagctttcaa	tgggctcgat	cctctcacnc	tgaaagctct	360
gtagagcagc	tcagaaccac	aaccactccc	aacattgacc	cttctggggg	tactgtctgt	420
ggcaccacaa	ggaaggagct	ggagatcccc	attaggactg	tccaccacaa	cttgaagcca	480
caaaactgca	cctcggccgc	gaccaccgct	ta			512

<210> 89

<211> 358

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(358)

<223> n = A,T,C or G

<400> 89

tcgagcgggc	cgcccgggca	ggtctgccag	tccccatccc	agacattctt	tgcattctaag	60
ctgangtctg	aactgagtg	ggtgggctgg	tggttccatc	ctcacaactc	cagtgagccg	120
ggtgtggccg	tgccctgcgt	ctctctggcg	gttagtgatg	ttggcatcat	ccaccttttt	180
caaaacaaaa	gcaactggact	gaagaanaat	ccnccctgt	ntccaccag	tccatggttt	240
ttaataaaaag	ggttatnnaa	gttgancaag	ncatcaccac	acacaancct	aagaacnttt	300
ttcatcnnct	cccaaaacaa	accncaccc	tgggaaactcc	gggcgcgaac	cacgccta	358

<210> 90

<211> 250

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(250)

<223> n = A,T,C or G

<400> 90

cgagcggccg	cccgggcagg	tctggatggg	gagacggact	ggaactgcgg	cttcccgtgg	60
cctgcacgca	caaggctccc	cacggccgcc	gaccttcttc	agattcgatc	gtatgtgtac	120
gcacnaagag	ccaaatattg	acattcacaa	cttcgtggga	atnttaccac	anaagactgc	180
gaccccccca	tcaggcgana	gcctgagcat	agaagaacac	cgctgtgggc	ttggcactgt	240
gggncccatc						250

<210> 91

<211> 133

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(133)

<223> n = A,T,C or G

<400> 91

tcgagcggcc	gnccgggcag	gtcccgggtg	gttgtttgcc	gaaatgggca	agttcnaaa	60
ncctgggaag	gtggtgcntg	tnctggctgg	acgtactcc	ggacgcnaag	ctgtcntcgt	120
gangancatt	gat					133

<210> 92
 <211> 232
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(232)
 <223> n = A,T,C or G

<400> 92
 agcgtgggtcg cggccgangt ctgtcacttt gcgggggtag cggccaattc cagccaccag 60
 agcatggctg taggggcat ctgaggtgcc atcatcaatg ttcttcacga tgacaagctt 120
 tgcgtccgga gtagcgcca gccaggacaa gcaccacctt cccacgtntt cangaactng 180
 cccatttcgg cataaccacc cgggacctgc ccggggcggn cgtcgaaaag cc 232

<210> 93
 <211> 480
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(480)
 <223> n = A,T,C or G

<400> 93
 agcgtgggtc gcggccgang tctgtangct caccggccag agaagaccac tgtgagcatt 60
 ttgccgtata tctgccttg ccatttgttc acttttttaa ctaaaatagg aacatccgac 120
 acacaccgtt tgcacgtct tctcccttga tattttaagc attttcccat gtcgtgagtt 180
 tctcagaaac atgtttttta caattgtact atttagtcat ngccattta ctataattta 240
 tctgaccatt tccctactgt taaaataact aagacgggtt ctgatttttc cactatttaa 300
 ataatgctgt gatgaatct tttaaaatct tctgatttct tacttttttc ccccttagat 360
 gcctggaagt ggtattttga ggtgaaagag tttgttcatt ttgaanatat ttctgtctct 420
 ctctcgacct gatgtgtana cgctcacttc cagtttagcag aaccaccta gtttgtgtct 480

<210> 94
 <211> 472
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(472)
 <223> n = A,T,C or G

<400> 94
 tcgagcggn cggccggcag ggtctgatgt cantcacaac ttgaagggat gccaatgatg 60
 taccaatccn atgtgaaatc tctcctctta tctcctatgc tgganaaggg attacaaagt 120
 tatgtggcng ataannaatt ccatgcacct ctantcatcg atgagaatgg agttcatgan 180
 ctggtgaacn atggtatctg aaccgcgatac cangttttgt ttgccacgat angantagct 240
 tttatttttg atagaccaac tgtgaaccta ccacacgtct tggacnactg anntctaact 300
 atccncaggg ttttattttg cttgttgaac tcttncagct nttgcaaact tcccaagatc 360
 canatgactg antttcagat agcattttta tgattccan ctcattgaag gtcttatnta 420

tntcntttttt tccaagccaa ggagaccatt ggacctcggc cgcgaccacc tn 472

<210> 95
 <211> 309
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(309)
 <223> n = A,T,C or G

<400> 95
 tcgagcggcc gcccgggcag agtgctgagc cagcgtcgcc gcgatgggtg tgttgagag 60
 cgagcagttc ctgacggaac tgaccagact tttccanaag tgccggacgt cgggcancgt 120
 ctatatcacc ttgaagaant atgacggctg aaccaaacc attccaaaga aangtactgt 180
 ggaggccttt gancccgag acaacnagt tctgttaaga actaccgatn ggaaanaana 240
 anatcagcac tgtgggtgag ctccnaggga agttaataan tttcgatgg gcttattcna 300
 acctcctta 309

<210> 96
 <211> 371
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(371)
 <223> n = A,T,C or G

<400> 96
 tcgagcggcc gcccgggcag gtccaccact cacctactcc ccgtctctat agatttgcct 60
 gttctgggca gttctcagca atggaatcct actgtgtatc tttttgtgac tggttcttta 120
 actcagcatc acattttcaa ggttcacca tgctgcagcc tggtccgta ctggtgacag 180
 tacttcattt ctctctccct tttgttcaga ccaaggtctc cctctgtccc caaggctaaa 240
 gtgcagttgg tgtgatcatg gctcactgca gcctcaaact cctggactca aacagtcctc 300
 ccatctcagc ctcccaaagt gctgatntta taagttgcaa gccctgcacc cagcctgtat 360
 ctccagtttg t 371

<210> 97
 <211> 430
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(430)
 <223> n = A,T,C or G

<400> 97
 tcganccggcc gcccgggcag gttnttttn tttnttttt nnnngntagt atttaaagan 60
 atttattaaa tcatcttatc accaaaatgg aaacatnttc caactagaaa catgcnacca 120
 tcatcttccc cagtccagtc ncaangtcca atattttntc tgctctgca gataaaaagt 180
 tcnnattttt ataccactc ttactcccc ccaaaatttt aattcngtcc tncctaaaa 240
 ttncnccggg taacaantta caaaatggc naaccaatta ttttaaanaa agttgcncn 300

```

ttnaaaangg aaactttntg gcaanttanc ctcttttccc tccccacccc ccantttaag      360
gggaaaacaa tggcactttg ctcttgcttn aacccaaaat tgtcttccaa aaactattaa      420
aatgttnaa                                     430

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<210> 98
<211> 307
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(307)
<223> n = A,T,C or G

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<400> 98
tcnaacggcc gccnngcnn gtctngcngc acctgtgcct canccgtcga tacctgggtcg      60
attgggacan ggaanacaat ntggttttca gggaggccac anatttgag aaacggatga      120
attctccttt attccgaant cagctccttg gtctccgtag anggtgatct tgaaattctc      180
ctgttttgaa aactttcttg aanaaacctt acctgctggt tgtatttggc ctcccactcg      240
gacaagtact cgttatccnn ggtactctta atgtgccac gtnaactccc cgggntggca      300
actggaa                                     307

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<210> 99
<211> 207
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(207)
<223> n = A,T,C or G

```

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<400> 99
gtccnggacc gatgttgcn aganntttct tgggtccanta gggtcnaaaa aatgataanc      60
naggtntanc acgtgaagat ntntatanag tcttantnaa aacncntaga tctgnatgac      120
gataantcga anacnggggg aggggntgag gngaggtggn gtganggaag anntggtgat      180
aaaagannna gntgataaga annagac                                     207

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<210> 100
<211> 200
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(200)
<223> n = A,T,C or G

```

```

<400> 100
acntnnacta gaantaacag ncnttctang aacactacca tctgtnttca catgaaatgc      60
cacacacata naaactccaa catcaatttc attgcacaga ctgactgtaa ttaattttgt      120
cacaggaatc tatggactga atctaatgcn nccccaaatg ttgttngttt gcaatntcaa      180
acatnnttat tccancagat                                     200

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```

<210> 101

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<211> 51
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(51)
 <223> n = A,T,C or G

<400> 101
 tcgagcggcc gcccgggcag gtctgaccag tgganaaatg cccagttatt g 51

<210> 102
 <211> 385
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(385)
 <223> n = A,T,C or G

<400> 102
 aacgtgggtcg cggccgaagt ccatgggtgct gggattaatc cactgtgacn gtgactctga 60
 gttgagttgt ttttcaatct tctccaagcc tgtggactca tctccacat ccttgggtag 120
 taggatgaac atgctgaaga tgctnatttt gaaaaggaac tctatgaatc ttacaattga 180
 atactgtcaa tgtttcccca tnacagaacg tggnccccca aggttccatc atctgcactg 240
 ggtttgggtg ttctgtcttg gttgactctt gaaaaggac atttcttttt gttttcttga 300
 attcanggaa attttcttca tccactttgc ccacaaaagt taggcagcat ttaaccccca 360
 anggattttg ggtctgggtc ctccc 385

<210> 103
 <211> 189
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(189)
 <223> n = A,T,C or G

<400> 103
 agcgtgggtcg cggccgaagt ctgcagcctg ggactgaccg ggaagctctg attatttacc 60
 caccacaggt angttgtgtt ctgaatctca agttcacagg ttaaggctac agcatcctca 120
 tctccacgg ggttgganntt gttgctggtg atgaanggtt tggggtggct ctgcataact 180
 gttgatctc 189

<210> 104
 <211> 181
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(181)
 <223> n = A,T,C or G

<400> 104
 tcgagcggcc gcccgggcag gtccaggtct ccaccaangc accaccgtgg gaagctggta 60
 attgatgcc accttgaagc cnntggggca ccattcncca actggatgct gcgcttggtt 120
 ttgatgggtg caatggcaca ttgactcttt tgggaaccac ttcaccacg tacaacaggc 180
 a 181

<210> 105
 <211> 327
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(327)
 <223> n = A,T,C or G

<400> 105
 tcgagcggcc gcccgggcag gtcttctgtg gagtctgcgt gggcatcgtg ggcagtgggg 60
 ctgccctggc cgatgctcan aaccccagcc tctttgtaaa gattctcadc gtgganatct 120
 ttggcagcgc cattggcctc tttggggcca tcgtcgcaat tcttcanacc tccanaatga 180
 anatgggtga ctanataata tgtgtgggtg gggcgtgcc tcacttttat ttattgctgg 240
 ttttctggg acagaactcg ggcgcgaaca cgcttanccg aattccaaca cactggcggg 300
 cgttactagt ggatccgagc tcggtac 327

<210> 106
 <211> 268
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(268)
 <223> n = A,T,C or G

<400> 106
 agcgtgggtc cggccgangt ctggcgtgtg ccacatcgtt cccacctcgc ttacaaaaac 60
 agtctgaac ttnatctaataaaaattattg tacacnacat ttacattaga aaaaganagc 120
 tgggtgtang aaaccgggcc tgggtgtccc tttaagcgaa ngtggctcca cagtggggc 180
 atcgtcgctt cctcnaagca aaaacgcaa tgaacccna agggggaaaa aggaatgaag 240
 gaactgnccn gggangnccg ctccgaaa 268

<210> 107
 <211> 353
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(353)
 <223> n = A,T,C or G

<400> 107
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 cctttacacn ctataggtg gggacatcat caacgccctg tgcttcagcc ctaaccgcta 120

```

ctggctgtgt gctgccgcag gccccagcat caagatctgg gatttanagg gaaagatcnt    180
tgtnnatgaa ctgaancnta aattatcagt tccannacca ngcaaaaacc acccngtgca    240
ctccctggcc tgggtctgctg atgggacctc gggcgcgaaac acgctnancc caattccanc    300
acactgggcg gncgttacta ntggatccga actcnggtac caancttggc gtt          353

```

<210> 108

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 108

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agcgtggctg cggccgaagt cctggcctca catgaccctg ctccagcaac ttgaacagga    60
naagcagcag ctacatcctt aaggtccgga aagtttagatg aagatttgga tcttgcatg    120
ncctgctcc caccatcttc tccnaatta taaacagcct ccttgggaag cagcagaatt    180
taaaaactct ccnctgccc tnttgaacta cacacnacc gggaaaacct ttttcanaat    240
ggcacaaaaa tncnaggga tgcatttcca tgaangaana aactgggtta cccaaaatta    300
ttgggttggg gaaatccngg gggggttttn aaaaaagggc aanccnccaa anaaaaaaac    360

```

<210> 109

<211> 101

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(101)

<223> n = A,T,C or G

<400> 109

```

atcgtggctn cggccgaagt cctgtgtcct ggatgggccc tgtgcancga atccgttggc    60
gactcctaac taccaaaaaa angactctcg gaagaaattt c                      101

```

<210> 110

<211> 300

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(300)

<223> n = A,T,C or G

<400> 110

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ccanggaaac ccagagtcac atgagatagg gtggctttcg ggacaggggg tcagangaat    60
ggtacatgga tctcagcccc tgatggacac ggaacagggtg tggtcagaac tcccangatt    120
ctgcatccan gatccagtct ctatagaagt tatggatcat tccttcattt cattcccccc    180
ttcatgaaaa aacttctgaa caagcctttt ttctcacttt ggggccctgt ttggcncaag    240
gtnttnantt ggggaaaaaa aaacaaatcc ntccnttan ccctccgtgg ggaatgacct    300

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<210> 111

<211> 366
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(366)
 <223> n = A,T,C or G

<400> 111
 cgagcggccg cccgggcagg tccttggtgt gccatctggt ancattgatt tctggaatgg 60
 aacanccttc tcaaagtttg gtcttgctan tcatgaagtc atgtcagtggt ctttaagtcac 120
 tgctgctcac ttcccttacc aggggaatata ctgcataagt ttctgaacac ctgttttcan 180
 tatttactgt tcctctcctg cccaaaattg gaaggacac cattaataaa tcaaatttga 240
 atcctgaaan aaaaacngga aatntttctc ttggaatttg gaatagaatt attcanttga 300
 ataacatggt ttttcccctt gccttgctct tcncaanaac atctggacac cggccgcgac 360
 acctta 366

<210> 112
 <211> 405
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(405)
 <223> n = A,T,C or G

<400> 112
 ctgactncta aacttctaata tcnatcaana taactactct ccttccgtct tncagagtgt 60
 tcacaataaa tctgtgaatc tggcatacac agttgctgga aaattgttct tcctccacna 120
 aaaggtcaat tggttcnccn atgaaanaag ataaattggt catccatcac tntgaacca 180
 tccaaaacgc cggcggaatt attnccccgt tattatgggg aacggaattt tnaataaatt 240
 tgggaangaa tggggctttt attgttttgt tttccccctt tcttggcatt gattggggcg 300
 caatgggccc cctcgctcan aanntgcccc ggggcccggc gctccaaaac cgaaattccc 360
 anccacactt ggcgggcccgt tactanttgg atccgaactc ggtta 405

<210> 113
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 113
 ggatagaaga gtatatgggt ttggcaccac ggggtggata ggcaaacat ttggttgata 60
 aggcgcagat tctgaactaa cttgtaaggc ttgtctggtt ttaggacagg taaaatgggg 120
 gaatggtaag gagagtttat aggttttagg agcccatgct gtagcaggca agtgataaca 180
 ggctttaatc ctttcaaagc atgctgtggg atgagatatt ggcatttgag cggggtaagg 240
 gtgattaggt tttaatgaga tggtaagggg tgcattgatcc ggtccgcaa ggaagggaag 300
 tagaggatc ttatacttgt ggggttaagg tgggggggat ataagaggga ggacgcaaa 360
 ggaggctttg gattaggaat aaggggccc aatgagatgc a 401

<210> 114
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 114
 angtcacag gangcangag gccaggctcc gtcccancca gtccatgatg ttgaagagga 60
 ggaagcagca catgggggttg aagaactgac tccacttccc aggactgggtg gagctgggtca 120
 ccatggctgt ggtggcgggg aagacggaca gggtgacttc tgaagacag tgaagactga 180
 aggttttctt ggcttctggg gctcatctgg ctctgattcc ggctccttct ccagggtcaag 240
 atccagggtt cagagctact ttcttggggg actactnggg aatcccgttc tcatctgggg 300
 gtngaggggg gacggggnaa gggncatgct tgtgaccag gtttcccacc tcggcccgcg 360
 accacgctaa ggcccgaatt ncagcacact tggcggccg t 401

<210> 115
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 115
 atccctgtaa gtctattaaa tgtaaataat acatacttta caacttctct tagtcggccc 60
 ttggcagatt aaatctttgc aaaattccat atgtgctatt gaaaaatgaa ataaaaacctc 120
 agatgtctga attcttattt caaatacagt tatataatta ttttaaatta caatatacaa 180
 tttctgttaa atacaactgt taagggattc tgagaacaat tataagatta taataatata 240
 tacaaactaa cttctgaaat gacatgggtt gtttccttcc caccctccta ccctctcaaa 300
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<210> 116
 <211> 301
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(301)
 <223> n = A,T,C or G

<400> 116
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 aatatcccta ggaggagtta gcatggannn tgatcatttt cttngnactc ctttangaca 120
 nggaaacagg natcagcatg anggtancan aaaccttatn accnangcgc acganctgac 180
 ttcttccaaa gagttgnggt tccgggcagc ggctattgcc gtgcccattg ctggagggtc 240
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 t 301

<210> 117
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)

<223> n = A,T,C or G

<400> 117

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gaaaaaatat	accacttcat	agctaagtct	tacagagaan	aggatttgct	aataaaactt	120
aagttttgaa	aattaagatg	cnggtanagc	ttctgaacta	atgcccacag	ctccaaggaa	180
nacatgtcct	atttagttat	tcaaatacca	gttgagggca	ttgtgattaa	gcaaacaata	240
tatttgttan	aactttgntt	ttaaattact	gntncttgac	attacttata	aaggagnctc	300
taactttcga	tttctaaaac	tatgtaatac	aaaagtatan	ntttcccat	tttgataaaa	360
gggccnanga	tactgantag	gaa				383

<210> 118

<211> 301

<212> DNA

<213> Homo sapien

<400> 118

ctgctagaat	cactgccgct	gtgctttcgt	ggaaatgaca	gttccttggt	ttttttgttt	60
ctgtttttgt	tttacattag	tcattggacc	acagccattc	aggaactacc	ccctgccccca	120
caaagaaatg	aacagttgta	gggagaccca	gcagcacctt	tcctccacac	accttcattt	180
tgaagttcgg	gtttttgtgt	taegttaatc	tgtacattct	grrtgccatt	gttacttgta	240
ctatacatct	gatatatagt	tacggcaaaa	gagtattaat	ccactatctc	tagtgcttga	300
c						301

<210> 119

<211> 401

<212> DNA

<213> Homo sapien

<400> 119

taaggacatg	gacccccggc	tgattgcatg	gaaaggaggg	gcagtgttgg	cttgtttggga	60
tacaacacag	gaactgtgga	tttatcagcg	agagtggcag	cgctttggtg	tccgcatggt	120
acgagagcgg	gctgcgtttg	tgtggtgaat	ggggaggaaa	tgctactgcc	gaagacaaaa	180
aacaagcttc	ttggtataaa	agactcttac	agaatatgtg	tattgtaatt	tattgatctg	240
gatgcttaag	tgtcatggac	agtaaatgaa	tttgaacttt	atgtttgagg	acatgacatt	300
gggtttgaaa	atataaactg	cttttgagca	gtttaagtca	gggcatttga	gaataaaaata	360
ggaactttct	cttcagtttg	taaaactctc	ttgcctctc	t		401

<210> 120

<211> 301

<212> DNA

<213> Homo sapien

<400> 120

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gaagctctat	ataaatccaa	gacaagcaac	aaacccttga	tgattattca	tcacttgggt	180
gagtgtccac	acagtcaagc	tttaaagaaa	gtgtttgctg	aaaataaaga	aatccagaaa	240
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c						301

<210> 121

<211> 2691

<212> DNA

<213> Homo sapien

<400> 121

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ctcatgggaa	gtcctggcac	agtttttgta	aagcccttgc	acagctggag	aaatggcatc	2520
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<210> 122

<211> 683

<212> PRT

<213> Homo sapien

<400> 122

Met Ala Leu Phe Val Arg Leu Leu Ala Leu Ala Leu Ala Leu

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	20	25	30
Val Leu Gln His Ser Arg Leu Arg Gly Arg Gln His Gly Pro Asn Val			
	35	40	45
Cys Ala Val Gln Lys Val Ile Gly Thr Asn Arg Lys Tyr Phe Thr Asn			
	50	55	60
Cys Lys Gln Trp Tyr Gln Arg Lys Ile Cys Gly Lys Ser Thr Val Ile			
65	70	75	80
Ser Tyr Glu Cys Cys Pro Gly Tyr Glu Lys Val Pro Gly Glu Lys Gly			
	85	90	95
Cys Pro Ala Ala Leu Pro Leu Ser Asn Leu Tyr Glu Thr Leu Gly Val			
	100	105	110
Val Gly Ser Thr Thr Thr Gln Leu Tyr Thr Asp Arg Thr Glu Lys Leu			
	115	120	125
Arg Pro Glu Met Glu Gly Pro Gly Ser Phe Thr Ile Phe Ala Pro Ser			
	130	135	140
Asn Glu Ala Trp Ala Ser Leu Pro Ala Glu Val Leu Asp Ser Leu Val			
145	150	155	160
Ser Asn Val Asn Ile Glu Leu Leu Asn Ala Leu Arg Tyr His Met Val			
	165	170	175
Gly Arg Arg Val Leu Thr Asp Glu Leu Lys His Gly Met Thr Leu Thr			
	180	185	190
Ser Met Tyr Gln Asn Ser Asn Ile Gln Ile His His Tyr Pro Asn Gly			
	195	200	205
Ile Val Thr Val Asn Cys Ala Arg Leu Leu Lys Ala Asp His His Ala			
	210	215	220
Thr Asn Gly Val Val His Leu Ile Asp Lys Val Ile Ser Thr Ile Thr			
225	230	235	240
Asn Asn Ile Gln Gln Ile Ile Glu Ile Glu Asp Thr Phe Glu Thr Leu			
	245	250	255
Arg Ala Ala Val Ala Ala Ser Gly Leu Asn Thr Met Leu Glu Gly Asn			
	260	265	270
Gly Gln Tyr Thr Leu Leu Ala Pro Thr Asn Glu Ala Phe Glu Lys Ile			
	275	280	285
Pro Ser Glu Thr Leu Asn Arg Ile Leu Gly Asp Pro Glu Ala Leu Arg			
	290	295	300
Asp Leu Leu Asn Asn His Ile Leu Lys Ser Ala Met Cys Ala Glu Ala			
305	310	315	320
Ile Val Ala Gly Leu Ser Val Glu Thr Leu Glu Gly Thr Thr Leu Glu			
	325	330	335
Val Gly Cys Ser Gly Asp Met Leu Thr Ile Asn Gly Lys Ala Ile Ile			
	340	345	350
Ser Asn Lys Asp Ile Leu Ala Thr Asn Gly Val Ile His Tyr Ile Asp			
	355	360	365
Glu Leu Leu Ile Pro Asp Ser Ala Lys Thr Leu Phe Glu Leu Ala Ala			
	370	375	380
Glu Ser Asp Val Ser Thr Ala Ile Asp Leu Phe Arg Gln Ala Gly Leu			
385	390	395	400
Gly Asn His Leu Ser Gly Ser Glu Arg Leu Thr Leu Leu Ala Pro Leu			
	405	410	415
Asn Ser Val Phe Lys Asp Gly Thr Pro Pro Ile Asp Ala His Thr Arg			
	420	425	430
Asn Leu Leu Arg Asn His Ile Ile Lys Asp Gln Leu Ala Ser Lys Tyr			
	435	440	445

Leu Tyr His Gly Gln Thr Leu Glu Thr Leu Gly Gly Lys Lys Leu Arg
 450 455 460
 Val Phe Val Tyr Arg Asn Ser Leu Cys Ile Glu Asn Ser Cys Ile Ala
 465 470 475 480
 Ala His Asp Lys Arg Gly Arg Tyr Gly Thr Leu Phe Thr Met Asp Arg
 485 490 495
 Val Leu Thr Pro Pro Met Gly Thr Val Met Asp Val Leu Lys Gly Asp
 500 505 510
 Asn Arg Phe Ser Met Leu Val Ala Ala Ile Gln Ser Ala Gly Leu Thr
 515 520 525
 Glu Thr Leu Asn Arg Glu Gly Val Tyr Thr Val Phe Ala Pro Thr Asn
 530 535 540
 Glu Ala Phe Arg Ala Leu Pro Pro Arg Glu Arg Ser Arg Leu Leu Gly
 545 550 555 560
 Asp Ala Lys Glu Leu Ala Asn Ile Leu Lys Tyr His Ile Gly Asp Glu
 565 570 575
 Ile Leu Val Ser Gly Gly Ile Gly Ala Leu Val Arg Leu Lys Ser Leu
 580 585 590
 Gln Gly Asp Lys Leu Glu Val Ser Leu Lys Asn Asn Val Val Ser Val
 595 600 605
 Asn Lys Glu Pro Val Ala Glu Pro Asp Ile Met Ala Thr Asn Gly Val
 610 615 620
 Val His Val Ile Thr Asn Val Leu Gln Pro Pro Ala Asn Arg Pro Gln
 625 630 635 640
 Glu Arg Gly Asp Glu Leu Ala Asp Ser Ala Leu Glu Ile Phe Lys Gln
 645 650 655
 Ala Ser Ala Phe Ser Arg Ala Ser Gln Arg Ser Val Arg Leu Ala Pro
 660 665 670
 Val Tyr Gln Lys Leu Leu Glu Arg Met Lys His
 675 680

<210> 123
 <211> 1205
 <212> DNA
 <213> Homo sapien

<400> 123
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 cgctccaggc cagtgaattg gttgtcactt actttttctg tggggaagaa attccatacc 180
 ggaggatgct gaaggctcag agcttgaccc tgggccactt taaagagcag ctcagcaaaa 240
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 aagtggagcg gatcgattga gccctgcggt ctggctttgg tgaactgttg gagcccgaag 420
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 ccaatgaaga agacaaagtc taaggaagaa tcggccagtg ggccttcggg agggcggggg 540
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 tgctttgcac tacgtccctc caagtgaaga cagactgttt tagacagact ttttaaaatg 960
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 ctgttttgtc ttaaaggctc tgaggattga ccatgttgcg tcatcatcaa cattttgggg 1080

gttgtgttgg atgggatgat ctgttgcaga gggagaggca gggaaacctg ctccttcggg	1140
ccccaggttg atcctgtgac tgaggctccc cctcatgtag cctccccagg cccaggggccc	1200
tgagg	1205

<210> 124

<211> 583

<212> DNA

<213> Homo sapien

<400> 124

ccaagaagca gtggccttat tgcateccaa accacgcctc ttgaccaggc tgcctccctt	60
gtggcagcaa cggcacagct aattctactc acagtgcctt taagtgaaaa tggctgagaa	120
agaggacca ggaagccgct ctggcgcttg gcagtccttg ggacgggatg gttctggctg	180
tttgagattc tcaaaggagc gagcatgtcg tggacacaca cagactattt ttagattttc	240
ttttgccttt tgcaaccagg aacagcaaat gcaaaaactc tttgagaggg taggagggtg	300
ggaaggaaac aaccatgtca ttccagaagt tagtttgtat atattattat aatcttataa	360
ttgttctcag aatcccttaa cagttgtatt taacagaaat tgtatattgt aatttataat	420
aattatataa ctgtatttga aataagaatt cagacatctg aggttttatt tcatttttca	480
atagcacata tggaattttg caaagattta atctgccaag ggccgactaa gagaagttgt	540
aaagtatgta ttattttacat ttaatagact tacagggata agg	583

<210> 125

<211> 783

<212> DNA

<213> Homo sapien

<400> 125

tcaaccatac atactgcttc cactagctaa taccaaatgc aggttctcag atccagacaa	60
atggagggaaa agaacattta tgcttccggt tcagaaagcc aagtcgtagt tttggccctt	120
cctttctcta aagtttattc ccaaaaacag gtagcattcc tgattgggca gagaagagga	180
tattttcagc ccacatctgc tgcagggatg tcattttctc ccactctcac tgtgactagt	240
aaagatctca ccacttctct ttggaatttc caactttgct tgtgattgaa tgtcacttcg	300
tgaatttgta ttatgtcaga tcacttgcca ttgctcttcc atatgcatca agttgccagg	360
cactgttgcg ctgtcgggcc cactggaatc cacgggggtg aaacaaattc aattatgctt	420
ttacagatcc tgctcaaaaa aggtttcaac tgcttaacca agtacagctc attcttccac	480
cttcttactc tgcaacccaa ccaagtgcc cactactacag gtaggtgccg agaaattccg	540
cagcagaaaa tccaaatca tttctgaaac ctcttgcta acaaaagttc tttttttctc	600
caaacagcat ataaaatgat caagtcttga aagagaaaag aagcaaagta gcaaatacat	660
caacaattca ctatcagaaa cacataaaat cccagagaga gagaaggcag tatctctgaa	720
tcatggatgg acttggaag ttcggaagga ttccgagtgc ttcctttcag aaagacaatt	780
ctg	783

<210> 126

<211> 604

<212> DNA

<213> Homo sapien

<400> 126

cctgctagaa tcactgccgc tgtgctttcg tggaaatgac agttccttgt tttttttgtt	60
tctgtttttg ttttacatta gtcattggac cacagccatt caggaactac cccctgcccc	120
acaaagaaat gaacagttgt agggagacct ttcctccaca caccttcatt	180
ttgaagttcg ggtttttgtg ttaaagttaa tctgtacatt ctgtttgcca ttgttacttg	240
tactatacat ctgtatatag tgtacggcaa aagagtatta atccactatc tctagtgcct	300
gactttaaat cagtacagta cctgtacctg cacggtcacc cgctccgtgt gtcgccctat	360
attgagggct caagctttcc cttgtttttt gaaaggggtt tatgtataaa tatattttat	420

gcctttttat	tacaagtctt	gtactcaatg	acttttgtca	tgacattttg	ttctacttat	480
actgtaaat	atgcattata	aagagttcat	ttaaggaaaa	ttacttggta	caataattat	540
tgtaattaav	agatgtagcc	tttattaaaa	ttttatat	ttcaaaaaaa	aaaaaaaaaa	600
aaaa						604

<210> 127

<211> 417

<212> DNA

<213> Homo sapien

<400> 127

ctgagcctct	gtcaccagag	aaggetgagg	ccccaatggc	acacctcaga	aacctacacc	60
ccgaggctgg	acggctggac	tcttgagcac	aagctccctc	tcgcaccctt	tgccagacag	120
tttgtctcca	atttcaaact	gacctaaagg	tcttactcct	ggattttttg	tttttaaacc	180
ttctcccagc	cagtcttcgg	gagggcatga	ttagagaagt	gctcctttgc	tgatggagga	240
ggggacctaa	ggaagaaggt	ggatcccagg	tgccctcctc	ctaattgatc	ctccccacct	300
agtttctctt	gcctctcttc	cttctaccag	gtcatgtttt	ttactctctg	ccccttctgc	360
ctcctagcat	ttcaaaaact	gtagagtgc	ccccatagtg	gacattttta	gtccagg	417

<210> 128

<211> 657

<212> DNA

<213> Homo sapien

<400> 128

ccacactgaa	atgcagttta	atgtggaaac	ttttctaaat	acatattgta	gcctctttgg	60
acatcaacgt	gtggcctgaa	atttttatta	ttgttccttc	ttctcctcca	ttaaaaaaa	120
aatctccttg	tggtatttag	tcattttacca	ttaacacata	ttatggctta	aaaagggcc	180
tccttctcct	ttctgagctg	gagttcttca	cgctcacctt	tgatgcatgg	ccttagctgg	240
ttactttgcc	ttggtttgg	catgaacatt	gggttagagt	gcctggcaac	ttgaatgcat	300
atggaaagaa	caatgccaa	tgatctgaca	taatacaaat	tccgaagtga	cattcaatca	360
caagcaaagt	tggaatttcc	aaagagaagt	ggtgagatct	ttactagtca	cagtgaagat	420
gggagaaaa	gacatacctg	cagcagatgt	gggctgaaaa	tatcctcttc	tctgccaat	480
caggaatgct	acctgttttt	gggaataaac	tttagagaaa	ggaagggcc	aaactacgac	540
ttggctttct	gaaacggaag	cataaatgtt	cttttctctc	atttgtctgg	atctgagaac	600
ctgcatttgg	tattagctag	tggaagcagt	atgtatgggt	gaagtgcatt	gctgcag	657

<210> 129

<211> 1220

<212> DNA

<213> Homo sapien

<400> 129

cgcgtgctcg	gtcacacca	acaaggcaag	ccaaggcg	ccctccccag	agggatccct	60
aacgtgcccc	gcatgtagat	tctggactaa	cagacaacat	acattcaccg	ctggtcaccc	120
agatcctcat	tcaaaccac	tgctggcaca	tccctttcct	tactttgccc	tggtgtacca	180
gccacggaag	gagcctctct	tggtttttct	ataaaatggg	taggcaggag	aaaagcaggt	240
gccctaagat	tgctctaagg	cccagcatgt	ggttacagtt	ctctgacttg	cagaacctgc	300
caggtgtatg	gctacaagtt	atcctcgtgc	tgatctgtct	cattactaag	ttaatggaga	360
agacagaaag	gtaaaaatca	cgtgtagcaa	gaacaactct	tatttcacaa	actcaggtat	420
gaaacgaaac	gcctgtcctt	catggaactg	cttttagctc	ctgtcttttc	aaaatggcag	480
agggagtcc	tacacacact	ttttccctgg	aggccaaggt	ctaggggtag	aaaggggagg	540
ggtggggcta	ccaggtagca	gttgacaacc	caaggtcaga	ggagtggccc	tcagtgtcat	600
ctgtccacag	tgatacctgc	caagatgacc	actgaccac	atctgggtct	agtcattggg	660
ctcctcagat	ttctggggcc	acctgcaagc	cccattccat	tcctacagat	ctctcagcca	720

cctgtaagtc	ctttgtgaag	atgtgggtga	cacaggggga	caggaaaacc	catttctcaa	780
cccagatcca	tgtctccact	gcttctactc	tgggttggga	ttcaggaaga	caggcacagt	840
cctctctgtt	catagaaaca	cctgccagtg	tcaaggattc	cagtcagggtg	tctatcccaa	900
ctggtcaggg	agagaagggc	agacccattc	tcaaagacca	ccatgtccaa	ggtctgacag	960
ctccccactg	gctgccccca	caggggcttt	aggctggtct	gggtcatggg	gaagcgtccc	1020
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tttatctaaa	ggactttggc	ttttgtaaat	cacaagccaa	taatagactt	ttttctcccc	1140
ctctgttttt	tgctgtgtca	tctctgcctt	gagactgcct	tgagacagtg	cttgccttga	1200
gagagtgagc	caattaacag					1220

<210> 130

<211> 1274

<212> DNA

<213> Homo sapien

<400> 130

ccatatgagt	ttgccatctc	catggatgcc	atttcaatgc	cttcagggtg	atcattctct	60
ccccaaagac	tgccccaggg	gtcatcactc	ctgtgacgaa	atgagggctg	gattgaagat	120
gttctgtctga	gcacccccct	ggctatcttt	gggtctctcag	aagagccata	atcatgacca	180
ttctcagcat	ctgaataatc	aggttctctc	caagtgcctg	gcaagttctg	attgtcctca	240
gcactgggat	agctctggctc	ccaaaaaaag	gggtggagagt	taggttgaat	gtcagcgct	300
ggataatcag	gctttcccag	agagtctgcg	tatggattga	ttctaaaact	tgtatgttcc	360
agattctttc	tggtacctgg	atggttcaaa	ttggctctgg	gtccaggatg	atcagagttg	420
ctctgagctc	cagggtagtc	cggttctaa	gagccaaaat	gatctggatg	tgttctggag	480
cctgcatagt	ttccactgct	gctggagcct	gcaaaaatcag	gatttctgtg	agatccaggg	540
tagtctgggt	gtctggatga	tgctcggtgg	taggyatgac	tctgaaattc	actataatct	600
ggetctggta	gagaggtagg	atggctctggg	cttgttctag	aggctgcaga	gtatgcattg	660
cttctgggtc	cagaatagtc	tggattactc	agagatctag	gataatttgg	ttctgccaga	720
gaccacagga	agtctggacg	tgttctggag	gctacagagt	atggattgct	cctgggtgccg	780
gggtaatctg	gattgttcag	aggacctgga	acatctggat	aaccttgagt	tttcaaatac	840
ccctgcgtac	ggttctgaga	ccctgaatag	tcagggtaat	ctgggtcttc	ctcagaccag	900
ttattcctgt	agtaggcaga	catgttggtg	tggactcttc	accctggagt	ggtaaaactgt	960
cccagcattt	gcaattactc	agggatcttt	tttttttcac	ttttttgccc	ttattgttct	1020
tgctttgtcc	caagtagatg	caaagtgtgt	gcaaaaccaac	ttgatcttaa	gatgttggtg	1080
agaacactgg	agtcacgtgt	ccatgggtcc	ttcaggctgg	cttttgatgg	gagctgggat	1140
gcagatgatt	tacggagggt	tataatctgt	gatgctggct	tgaagtctga	atattccaag	1200
ttgctgactg	caggcagagc	ctcatgtcct	cctggcgctc	ctggtgccgc	tgcttgcgct	1260
ggccctcggg	tcga					1274

<210> 131

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)... (554)

<223> n = A,T,C or G

<400> 131

ctgtaattct	gccttttcta	ccttcattcc	atccttcctc	tgcccagata	aagkccagca	60
gaaattcctc	ctttctacct	ctctgggact	ctgagacagg	aaatcttcaa	ggaggagttt	120
ttccctcccc	actattctta	ttctcaaccc	ccagaggaac	caaggctgct	gtaccacact	180
cagggacaga	actccacact	atagtgggaa	agcttcaggg	acccctcctt	ttagtgtctc	240
gggctcacct	atgctactgg	tccttttggc	aaaaaaggaa	aatgatagag	ccagggttgc	300

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ccctgatgta gcagccttac tgtggagggg ccaaagctgg tgttcagagc tcacccaagg 360
agggaggtga taaggtgtca tgcgttctgc tgaaccact ggntgggtatg aacatgaggc 420
ttgggggtgag ggaaaccaag taggggttgg agaaggagca gcacctttgt macacctggc 480
taccatagc tagctttctg ccctcaaaaa ctcagccttc aagggatcca gcccacacac 540
gccacaggca gcag 554

```

<210> 132

<211> 787

<212> DNA

<213> Homo sapien

<400> 132

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ctgggtcacc aactcttgtg gaagagggga attgagatcg agtactgaat atctggcaga 60
gaggctggaa tccttcagcc ccagagccca gggaccactc cagtagatgc agagaggggc 120
ctgcccaggg gtcagggcag tgggtatcac tgggtacatc aagaatatca gggctgggga 180
ggcatctttg tttcctgggtg ccctcctcaa agttgctgac actttgggga cgggaagggg 240
tagaagtagg gctgctcctt ttggagctgg agggaataga cctggagaca gagttgaggc 300
agtcgggctg tccaggttct aagcatcaca gcttctgcac tgggctctga ggagattctc 360
agccagagga tccagcctc ctctccctc aaatgtcagt ccaagcaa at accaaagcaa 420
cgcctcgatt ttgtggaagt caattagaga tgtggggagc tatcggagac aagcactatt 480
gtaccttttc acctccacac ttgtcacaag cagggactgt ctctcccca ctttgcctgc 540
cacgcctgcc atggcttgag ctgggggtgag gagtggctct tatcttcttt gggagatcct 600
gactgggtgc gcacttgcta agggcaggaa gtctggaggg ctgcaggaat ggtgccgttg 660
ataaacaggt ggacttataa tcatcatgca ctgcaattgt agaacatagt ctctgcctt 720
ttctcatttg tataattgtc tgggtcaata ttctccaat attgggaggg gctctgcagc 780
cctccag 787

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<210> 133

<211> 219

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(219)

<223> n = A,T,C or G

<400> 133

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tactgctcta agttttgtna aatthttcat atthttaatt caagcttatt ttggagagat 60
aggaaggtca tttccatgta tgcataataa tcctgcaaag tacaggtagt ttgtctaaga 120
aacattggaa gcagggttaa tgttttgtaa actttgaaat atatggtcta atgtttaagc 180
agaattggaa nagactaata tcggttaaca aataacaac 219

```

<210> 134

<211> 234

<212> DNA

<213> Homo sapien

<400> 134

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gatttttaaaa acatcatgac tttgaactga aaaacataca cgtttagcac acaaattattg 60
taatatgaat gaactccaac tccatttgaa aacatgtgaa tcaaagtaca gttttagaag 120
ttagtaattc acatttaagc aagtttagcgc cttgctgaat acagcctttg taaaaaagag 180
acttagtgca tattttaatg gtacattgtg gttttgtacc atttggttga gttg 234

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<210> 135

<211> 414
 <212> DNA
 <213> Homo sapien

<400> 135
 ctccagcctg gctatatccg gtcccgtctat aacctgggca tcagctgcat caacctcggg 60
 gctcaccggg aggctgtgga gcactttctg gaggccctga acatgcagag gaaaagccgg 120
 ggcccccggg gtgaaggagg tgccatgtcg gagaacatct ggagcaccct gcgtttggca 180
 ttgtctatgt taggccagag cgatgcctat ggggcagccg acgcgcggga tctgtccacc 240
 ctctaaacta tgtttgccct gccccagtga cagtgggacg ggctgccctg tgagtgtcca 300
 cctggggatt aaatatgtct tcaacaaggg aggcctggct tctacaatgg tttaggtaaa 360
 ggggcctttg aagtagttct ggccaggctt gcaatacaca caacacaaga gccca 414

<210> 136
 <211> 461
 <212> DNA
 <213> Homo sapien

<400> 136
 gaagtgatta ataggtttat ttgcatatac acagagaaga gtcagcattg ttgggtgaga 60
 agaggcaggc tgtgaggagg taaggcttca gcagaggagg gcaccttgac agacaacacg 120
 agactcctat taaatcagca cagttgcaaa cttcacctgc etcaagccaa cagctcattg 180
 aactcatatg tcgattgaga atcattttaca aaaccaggag agaaacaatg ggaagagcaa 240
 cggctctctca tccttgacc tgacactcaa aacattatgt acaggatgca ggaacaaaat 300
 ctgtctgatc agtgccctct cctgctggga aaaacaccca tcacggaaga atttggggat 360
 taaatatgtc ttcaacaagg gaggcctggc ttctacaatg gtttaggtaa aggggccttt 420
 gaagtagttc tggccaggct tgcaatacac acaacacaag a 461

<210> 137
 <211> 269
 <212> DNA
 <213> Homo sapien

<400> 137
 atagcaaagt gacacaaatt acaaatgtgt gtgcgtggga cgaagacatc tttgaaggtc 60
 atgagtttgt tagtttaaca tcatatattt gtaatagtga aacctgtact caaaatataa 120
 gcagcttgaa actggcttta ccaatcttga aatttgacca caagtgtctt atatatgcag 180
 atctaagtga aaatccagaa cttggactcc atcgttaaaa ttatttatgt gtaacattca 240
 aatgtgtgca ttaaatatgc ttccacagt 269

<210> 138
 <211> 452
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(452)
 <223> n = A,T,C or G

<400> 138
 ctccatggga ggcaaaatat agagaattta tgggtgccaa ctcttatgta atcactggac 60
 taatcttccc tggtaactat gcaacatttg gacagaaagg cacacaaaaa agtttaataa 120
 tttcatgtgc caatctggaa aaaaataatt taaatcaaca gaacagacag tacatctaca 180
 caaatgagga aagcagaaaa gatacctcac attcatttat ctgaggtttc aaagtggctt 240

caatgctaaa gtaaattgat taacatttgg aaaatacaag acaatttttt tgtttgtttt	300
caattttttt agctctatac aatgattaca acataagaca aaaaaaaaaa aaaaacacaa	360
aaaacaaaac aaaaaaggag ttcaggactt gttatcagtg tccaagtggc taanaactgg	420
ttcccataac aagcattgaa agttaaggcc cc	452

<210> 139

<211> 474

<212> DNA

<213> Homo sapien

<400> 139

tgtgcctcat tgaggttaca attgaaacag atgtgagcac ctgagagact ttccctgatt	60
atattcctcc acaaaccact gtaccatatt accttatttt atcttcttga aattcttatt	120
cattggcttg tttgttgtct ctttgcatta gatatatgta agctccttgg cataaatttg	180
acattggtag gggactgaca ttctaacctg gcccaggccc taggagagag ataactccac	240
aaagcagcac atactatctt aggttagcag ggagctaaact caccatgtag cagatgaaaa	300
aaaccaaacc cagcactgtg cataaatacc acttgccaag aagtcagggtc ctcggaacc	360
gagaatcaac ctgagcaca acgcagggtg ctgggctctg ttccccctta gccaccacct	420
cagcctctcc cctcccctgc cccaagtgcc caagagcttg gctctctgtg cttt	474

<210> 140

<211> 487

<212> DNA

<213> Homo sapien

<400> 140

cttccctgcc tcgtgttcct gagaaacgga ttaatagccc tttatcccc tgcaccctcc	60
tgcaggggat ggcactttga gccctctgga gccctcccct tgctgagcct tactctcttc	120
agactttctg aatgtacagt gccgttggtt gggatttggg gactggaagg gaccaaggac	180
atgacccca agctgtcctg cctagcgtcc agcgtcttct aggagggttg ggtctgcctg	240
tcctggtgtg gttgggttgg cctgttttg tgtgactacc cccccctc cccgaaccga	300
gggacggctg ctttgtctc tgcctcagat gccacctgcc ccgcccagtc tccccatcag	360
cagcatccag actttcagga agggcagggc cagccagtcc agaaccgcat ccctcagcag	420
ggactgataa gccatctctc ggagggcccc ctaataccca agtggagtct ggttcacacc	480
ctggggg	487

<210> 141

<211> 248

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(248)

<223> n = A,T,C or G

<400> 141

ttaaagatgg ggaaatgagg cctgnaaata gaaaagattt gcctagagtc acacacactg	60
tcaggtcagg tagagtcaaa atcaggcacc ccgactcaca gactgcttca cattgccatc	120
agagattgtc ctgcaacaat attatgttta gttctactgc agaataataa ctggatctta	180
cccccttgc ctgatctggc cacaaacttg ttttccaggt ctttccatta ggctctcttc	240
agctaatt	248

<210> 142

<211> 173

<212> DNA

<213> Homo sapien

<400> 142

tactaagatt	gtccaagcct	ccctcttaaa	actttctttc	ccttttagagg	aatcattact	60
tcgtattaaa	agtttctact	tccttgtaga	atatctacat	ccaatgggcc	atggcacaaa	120
atttaagtct	agaaaagaatc	ttaaaggctc	atcttatagt	aaccagaggc	agg	173

<210> 143

<211> 511

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 143

cctcgtcaga	ggggtggttc	ctggtnacct	gtactccacg	gacctcggtg	aagcaaaagc	60
ttcagggcag	agggaatgag	gcaaccagct	ggcagccccg	ctgggccccg	tggctcctgc	120
tctcctattg	gacgtagagg	caggggagag	acttctctat	acaaatattc	tcatcacaga	180
agggatgata	cttgctgctc	tgccgtaggg	tttttgatgc	tgagctatgc	tgacatgac	240
gttaacctaa	agaacttggg	ctgagctttt	aaaaaaggac	agcaaacaat	tttataatcc	300
ttaaagtgtg	atagacggtt	acactagtgc	agggatttgg	ggaggctctt	tgggtgtgga	360
ggctgtcact	tgtatttatt	gtgactctaa	atctttgata	gtaaaacaaa	tgtaaaaaga	420
aatgtttgcc	accagatggg	aatagaagtt	ccaataagca	ggctggaatg	ggtggctata	480
cgttgatatca	cgagggaagt	ttagactctg	a			511

<210> 144

<211> 190

<212> DNA

<213> Homo sapien

<400> 144

cattcttctg	tcacatgcc	attcagttgt	caatcccatt	gtctatgctt	accggaaccg	60
agacttccgc	tacacttttc	acaaaattat	ctccaggtat	cttctctgcc	aagcagatgt	120
caagagtggg	aatggtcagg	ctggggtaca	gcctgctctc	ggtgtggggc	tatgatctag	180
gctctcgct						190

<210> 145

<211> 169

<212> DNA

<213> Homo sapien

<400> 145

gatgtgggta	tctcctcaga	tggccagttt	gcctctcag	gctcctggga	tggaaacctg	60
cgcctctggg	atctcacaa	gggcaccacc	acgaggcgat	ttgtgggcca	taccaaggat	120
gtgctgagtg	tggccttctc	ctctgacaac	cggcagattg	tctctggat		169

<210> 146

<211> 511

<212> DNA

<213> Homo sapien

<400> 146

atctagagaa	gatttgggaa	acacatgata	gctatgggta	aataacttaac	agggcaatca	60
caggaagat	gactagattt	cctaacatcc	atgagtgaaa	tttatagaag	tatactctct	120
gacttgatat	aaaggaagat	tttaaaaaac	atgactgttc	aggagtgttc	aagtaggggc	180
agatgaccag	tgattgggaa	tacttcgtaa	gcaggagcaa	gtaagatctg	agccactgtt	240
ctatcggtag	ggtgtctgtg	gtattccttg	gtcaaagaag	tactctaagc	aacttcagtc	300
tcacgaatta	ctatcacccct	cgtgggcata	catgatgggt	accctaaaga	ggaagtttca	360
gaaggcagta	atattggatc	ctggaatagt	cagacaggag	ccttcattgca	gatacccttt	420
tcagttctcc	atacacccat	tcacaagtgg	tcacaaaaac	accaggtacc	tttacttggc	480
tttaccctact	taacaatatg	ctcaatatga	g			511

<210> 147

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 147

gaccagttga	gttcttcctg	gctattgtat	aatccacagc	cacactgtga	aagcaaattct	60
ggccagttag	caacacaggg	agaatctgcc	tgaactgacc	aaaggtgtcc	atacttcattg	120
tcagtgaagaa	tttcacctcc	atcatgttct	aaagagccaa	caacagattc	tagggcactg	180
caaaatgctt	cagcaattaa	ttgaagttct	gtttgagtac	attcatcatc	tttgagaatg	240
ctttctgggt	cgttgtgtgt	cttgtgtctg	atatatgcag	ccaaatgagt	ttcagtacag	300
ccacctccca	acaaagccca	tggttccttg	agtgttaact	gcaggacatg	cagtgcctgc	360
tgacacgtga	gcttcagctc	atcccangca	gtgtcatttc	tgttgcagag	aagccaagct	420
g						421

<210> 148

<211> 237

<212> DNA

<213> Homo sapien

<400> 148

acacaccact	gttggccttc	catctggggt	aagtcaactg	tgagttagaaa	ccgaagataa	60
cagtttttga	ttcataatgg	ccttttcata	ctccaagtac	ttttgagcac	agagcctctt	120
gctttctgacc	tggcacttgg	aacacagata	tatatatctt	ttgttctgtc	cctgggaaac	180
tgatatttgt	gtaagacaac	caccagatat	tttctctaata	aaaatcttct	aaaatta	237

<210> 149

<211> 168

<212> DNA

<213> Homo sapien

<400> 149

agagaaagt	aaagtgcatt	aatgtttgaa	gacaataagt	ggtgggtgtat	cttgttttcta	60
ataagataaa	cttttttgtc	tttgctttat	cttattaggg	agttgtatgt	cagtgtataa	120
aacatactgt	gtgggtataac	aggcttaata	aattctttaa	aaggagag		168

<210> 150

<211> 68

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(68)

<223> n = A,T,C or G

<400> 150

ggtggggttt ggcagagatg antttaagtg ctgtggccag aagcgggggg ggggtttggt	60
ggaaattt	68

<210> 151

<211> 421

<212> DNA

<213> Homo sapien

<400> 151

aggtgacacg tattcgggat gaaagtataa tagtcattcc ttcaaccctt gcatttatgg	60
actctggaaa tcgaagatcc acagtgagta aagatgttcg tccaaagaca aaaaatagaa	120
acagctcaac aaagcgagag acaaaaaaac aaaatggcac tgtggctctg cctttgaagt	180
ctgggctcca gcagagggct gatcttccca caggagacga gacggcctat gacactctcc	240
agaactgttg tcagtgccga attttacttc ccttgcccat tctaaatgag caccaggaga	300
agtgccagag gttagctcac caaaagaaac tccagtgggg ctggtgagat ggctcagcgg	360
gtaagagcac ccgactgctc ttccgaaggc cgggagttca aatccagca accacatggg	420
g	421

<210> 152

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 152

gaattcggca cnagctcgtg ccgccagggt nggtccnttt ttgtctccgc ctgccanga	60
cttcctacag ctatcgccag tcgtcgcca cgtctcctt cngaggcctg ggcggcggct	120
ccgtgcgttn tgggcccggg gtcgcctttc netcnccag cattcacggg ggctccggcg	180
gccgcggcgt atccgtgtcc tccgcccgct ntgtgtctc gtctcctcn ggggcctacg	240
gctngctgct acngcggtt cctgaccgct tccnacgggc tgctggcngg caacgagaag	300
ctaaccatgc agaacctnaa cnaccgcctg gcctcctacc tgnacaaggt gcgcncctg	360
taggcggcca acggcnagct agaggtgaag atccnctact ggggtaccaga agcaggggcc	420
tgggcccctgc ccgactacag ccactnctnc acnaccatgc agtacctgcn ggganaagat	480
tntngggngc caccatngag aactgca	507

<210> 153

<211> 513

<212> DNA

<213> Homo sapien

<400> 153

gaattcggca cgaggtggct cagatgtcca ctactgggag tatggtcgaa ttgggaattt	60
tattgtgaaa aagcccatgg tgctgggaca tgaagcttcg ggaacagtcg aaaaagtggg	120

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atcatcggta aagcacctaa aaccagggtga tcgtgttgcc atcgagcctg gtgctccccg 180
agaaaaatgat gaattctgca agatgggccc atacaatctg tcaccttcca tcttcttctg 240
tgccgcgccc cccgatgacg ggaacctctg ccggttctat aagcacaatg cagccttttg 300
ttacaagctt cctgacaatg tcacctttga ggaaggcgcc ctgatcgagc cactttctgt 360
ggggatccat gcctgcagga gaggcggagt taccctggga cacaagggtcc ttgtgtgtgg 420
agctgggcca atcgggatgg tcactttgct cgtggccaaa gcaatgggag cagctcaagt 480
agtgtgact gatctgtctg ctacccgatt gtc 513

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<210> 154

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)... (507)

<223> n = A,T,C or G

<400> 154

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ggcacgagct cgtgccgaat tcggcncgag cagacacaat ggtaagaatg gtgcctgtcc 60
tgctgtctct gctgtgctt ctgggtcctg ctgtccccc ggagaaccaa gatggtcgtt 120
actctctgac ctatatctac actgggctgt ccaagcatgt tgaagacgtc cccgcgtttc 180
agggccttgg ctactcaat gacctccagt tctttagata caacagtaaa gacaggaagt 240
ctcagcccat gggactctgg agacagggtg aaggaatgga ggattggaag caggacagcc 300
aacttcagaa ggccagggag gacatcttta tggagaccct gaaagacatc gtggagtatt 360
acaacgacag taacgggtct cacgtattgc aggggaaggtt tggttgtgag atcgagaata 420
acagaagcag cggagcattc tggaaatatt actatgatgg aaaggactac attgaattca 480
acaaagaaat cccagcctgg gtcccc 507

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<210> 155

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)... (507)

<223> n = A,T,C or G

<400> 155

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ggcacgagga gacctaaagg ctgagtntcg ggaacaggag aaagctctgt tggccctcca 60
gcagcagtgt gctgagcagg cacaggagca tgagggtggag accagggccc tgcaggacag 120
ctggctgcag gccagggcag tgcctcaagga acgggaccag gagctggaag ctctgcgggc 180
agaaagtcag tctccccggc atcaggagga ggctgcccgg gcccgggctg aggctctgca 240
ggaggccctt ggcaaggctc atgctgccct gcaggggaaa gagcagcatc tcctcgagca 300
ggcagaattg agccgcagtc tggaggccag cactgcaacc ctgcaagcct ccctggatgc 360
ctgccaggca cacagtcggc agctggagga ggctctgagg atacaagaag gtgagatcca 420
ggaccaggat ctccgatacc aggaggatgt gcagcagctg cagcaggcac ttgccagag 480
ggatgaagag ctgagacatc agcagga 507

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<210> 156

<211> 509

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(509)
 <223> n = A,T,C or G

<400> 156
 ggcacgagga cagagagaac cctgtngaaa gagcgttacc aggaggtcct ggacaaacag 60
 aggcaagtgg agaatcagct ccaagtgcaa ttaaagcagc ttcagcaaag gagagaagag 120
 gaaatgaaga atcaccagga gatattaaag gctattcagg atgtgacaat aaagcgggaa 180
 gaaacaaaga agaagataga gaaagagaag aaggagtttt tgcagaagga gcaggatctg 240
 aaagctgaaa ttgagaagct ttgtgagaag ggcagaagag aggtgtggga aatggaactg 300
 gatagactca agaatcagga tggcgaaata aataggaaca ttatggaaga gactgaacgg 360
 gcctggaagg cagagatctt atcactagag agccggaaag agttactggt actgaaacta 420
 gaagaagcag aaaaagaggc agaattgcac cttacttacc tcaagtcaac tcccccaaca 480
 ctggagacag ttcgttccaa acaggagtg 509

<210> 157
 <211> 507
 <212> DNA
 <213> Homo sapien

<400> 157
 ggacacgaggg cagccctcct accggcgcac gtggtgccgc cgetgctgcc tcccgcctgc 60
 cctgaaccca gtgcctgcag ccatggctcc cggccagctc gccttattta gtgtctctga 120
 caaaaccggc cttgtggaat ttgcaagaaa cctgaccgct cttggtttga atctggctgc 180
 ttccggaggg actgcaaaaag ctctcagggg tgctggctcg gcagtcagag atgtctctga 240
 gttgacggga tttectgaaa tggtgggggg acgtgtgaaa actttgcatc ctgcaatcca 300
 tgctggaatc ctagctcgta atattccaga agataatgct gacatggcca gacttgattt 360
 caatcttata agagttgttg cctgcaatct ctatcccttt gtaaagacag tggtctctcc 420
 aggtgtaagt gttgaggagg ctgtggagca aattgacatt ggtggagtaa ccttactgag 480
 agctgcagcc aaaaaccacg ctcgagt 507

<210> 158
 <211> 507
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(507)
 <223> n = A,T,C or G

<400> 158
 ggacacgagtc gagctgtgcc tattcngtc aatccaagag tgagtaatgt gaagtctgtc 60
 tacaaaaccc acattgatgt cattcattat cggaaaacgg atgcaaaacg tctgcatggc 120
 cttgatgaag aagcagaaca gaaacttttt tcagagaaac gtgtggaatt gcttaaggaa 180
 ctttccagga aaccagacat ttatgagagg cttgcttcag ccttggctcc aagcatttat 240
 gaacatgaag atataaagaa gggaattttg cttcagctct ttggcgggac aaggaaggat 300
 tttagtcaca ctggaagggg caaatttcgg gctgagatca acatcttgct gtgtggcgac 360
 cctggtacca gcaagtccca gctgctgcag tacgtgtaca acctcgtccc caggggccag 420
 tacacgtntg ggaagggctc cagtgcantt ggcctnactg cntacgtaat gaaagacctt 480
 gagacaaggn anctggnnct gnnacag 507

<210> 159
 <211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 159

ggcacnanaa	accaggatta	tggtnnngat	ccaaagattg	ctaattgcaat	aatgaaggca	60
gcagatgagg	tagctgaagg	taaattaaat	gatacttttc	ctctcgtggt	atggcagact	120
ggatcaggaa	ctcagacaaa	tatgaatgta	aatgaagtca	ttagcaatag	agcaattgaa	180
atgttaggag	gtgaacttgg	cagcaagata	cctgtgcatc	ccaacgatca	tgtaataaaa	240
agccagagct	caaatgatac	ttttcccaca	gcaatgcaca	ttgctgctgc	aatagaagtt	300
catgaagtac	tgttaccagg	actacagaag	ttacatgatg	ctcttgatgc	aaaatccaaa	360
gagtttgac	agatcatcaa	gattggacgt	actcatactc	aggatgctgt	tccacttact	420
cttgggcagg	aatttagtgg	ttatgttcaa	caagtaaaat	atgcaatgac	aagaataaaa	480
gctgccatgc	caagaatcta	tgagctcg				508

<210> 160

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 160

ggcacgagct	tgagcaaaag	tcattctnaag	gaattagagg	acacacttca	ggttaggcac	60
atacaagagt	ttgagaagg	tatgacagac	cacagagttt	ctttggagga	attaaaaaag	120
gaaaaccaac	aaataattaa	tcaaatacaa	gaatctcatg	ctgaaattat	ccaggaaaaa	180
gaaaaacagt	tacaggaatt	aaaactcaag	gtttctgatt	tgtagacac	gagatgcaag	240
ttagagggtg	aacttgcgtt	gaaggaagca	gaaactgatg	aaataaaaaat	tttgctggaa	300
gaaagcagag	cccagcagaa	ggagaccttg	aaatctcttc	ttgaacaaga	gacagaaaaat	360
ttgagaacag	aaattagtaa	actcaaccaa	aagattcagg	ataataatga	aaattatcag	420
gtgggcttag	cagagctaag	aactttaatg	acaattgaaa	aagatcagtg	tatttccgag	480
ttaattagta	gacatgaaga	agaatcta				508

<210> 161

<211> 507

<212> DNA

<213> Homo sapien

<400> 161

ggcacgagcg	ctaccggcgc	ctcctctgcg	gccactgagc	cggagccggc	ctgagcagcg	60
ctctcgggtg	cagtaccac	tggaaggact	taggcgctcg	cgtggacacc	gcaagcccct	120
cagtagcctc	ggccaagag	gcctgtcttc	cactcgctag	ccccgccggg	ggtccgtgtc	180
ctgtctcggg	ggccggaccc	gggcccagag	ccgagcagta	gccggcgcca	tgctcgggtg	240
gggcatagac	ctgggcttcc	agagctgcta	cgctcgctgtg	gcccgcgccg	gcggcatcga	300
gactatcgct	aatgagtata	gcgaccgctg	cacgccggct	tgcatcttct	ttggctcctaa	360
gaatcggtca	attggagcag	cagctaaaag	ccaggtaatt	tctaatagca	agaacacagt	420
ccaaggattt	aaaagattcc	atggccgagc	attctctgat	ccatttgtgg	aggcagaaaa	480
atctaacctt	gcatatgata	ttgtgca				507

<210> 162
 <211> 507
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(507)
 <223> n = A,T,C or G

<400> 162
 ggcacgagca gctgtgcacc gacatgntct cagtgtcctg agtaagacca aagaagctgg 60
 caagatcctc tctaataatc ccagcaaggg actggccctg ggaattgcca aagcctggga 120
 gctctacggc tcaccaatg ctctggtgct actgattgct caagagaagg aaagaaacat 180
 atttgaccag cgtgccatag agaatgagct actggccagg aacatccatg tgatccgacg 240
 aacatttgaa gatatctctg aaaaggggtc tctggaccaa gaccgaaggc tgtttgtgga 300
 tggccaggaa attgctgtgg ttacttccg ggatggctac atgcctcgtc agtacagtct 360
 acagaattgg gaagcacgtc tactgctgga gaggtcacat gctgccaaat gccagacat 420
 tgccaccag ctggctggga ctaagaaggt gcagcaggag ctaagcaggc cgggcatgct 480
 ggagatgttg ctccctggcc agcctga 507

<210> 163
 <211> 460
 <212> DNA
 <213> Homo sapien

<400> 163
 ggcacgagaa ataactttat ttcattgtgg gtcgcgggtc ttgtttgtgg atcgctgtga 60
 tcgtcacttg acaatgcaga tcttcgtgaa gactctgact ggtaagacca tcaccctcga 120
 gggttagccc agtgacacca tcgagaatgt caaggcaaaag atccaagata aggaaggcat 180
 cctcctgac cagcagaggc tgatctttgc tggaaaacag ctggaagatg ggcgcaccct 240
 gtctgactac aacatccaga aagagtccac cctgcacctg gtgctccgtc tcagaggtgg 300
 gatgcaaac ttcgtgaaga cactcactgg caagaccatc acccttgagg tggagcccag 360
 tgacaccatc gagaacgtca aagcaaagat ccaggacaag gaaggcattc ctctgacca 420
 gcagaggttg atctttgccg gaaagcagct ggaagatggg 460

<210> 164
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 164
 ggcacgagcc ggatctcatt gccacgcgcc cccgacgacc gcccgcgtg cattccccgat 60
 tccttttggg tccaagtcca atatggcaac tctaaaggat cagctgattt ataattttct 120
 aaaggaagaa cagacccccc agaataagat tacagtgtgt ggggttggtg ctgttggtat 180
 ggcctgtgcc atcagtatct taatgaagga cttggcagat gaacttgctc ttgttgatgt 240
 catcgaagac aaattgaagg gagagatgat ggatctccaa catggcagcc ttttccttag 300
 aacaccaaag attgtctctg gcaaagacta taatgtaact gcaaactcca agctgggtcat 360
 tatcacggct ggggcacgtc agcaagagg agaaagccgt cttaatttgg tccagcgtaa 420
 cgtgaacatc tttaaattca tcattcctaa tgttgtaaaa ta 462

<210> 165
 <211> 462
 <212> DNA

<213> Homo sapien

<400> 165

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ggcacgagga agccatgagc agcaaagtct ctgcgcacac cctgtacgag gcggtgcggg      60
aagtcctgca cggaaccag cgcaagcgcc gcaagttcct ggagacgggtg gagttgcaga      120
tcagcttgaa gaactatgat cccagaagg acaagcgctt ctcgggcacc gtcaggctta      180
agtccactcc ccgcctaag ttctctgtgt gtgtcctggg ggaccagcag cactgtgacg      240
aggctaaggc cgtggatatc cccacatgg acatcgaggc gctgaaaaaa ctcaacaaga      300
ataaaaaact ggtcaagaag ctggccaaga agtatgatgc gtttttggcc tcagagtctc      360
tgatcaagca gattccacga atcctcggcc caggttttaa taaggcagga aagttccctt      420
ccctgtcac acacaacgaa aacatggtgg ccaaagtgga tg                          462

```

<210> 166

<211> 459

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(459)

<223> n = A,T,C or G

<400> 166

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ggcacgagag ggacctgtnt gaatggntcc actagggtnn anntgnctct tacttttaac      60
cantnaaasn gacctgcccg tgaanangcg ggcntgacac annaanacga gaagacccta      120
tggagcttta atttattaat gcanacagna cctaacaac ccacangtcc taaactacca      180
agcctgcatt aaaaatttcg gntggggcna cctcnagca naaccaacc tccgagcaac      240
tcatgctaag acttcaccag tcaaagctga actactatac tcaattgatc caataacttg      300
accaacagan caagntaccc tagggataac ancacaatcc tattctagac cccttatnac      360
caatangntt tacacctcna tngnggaacc aggacatccg atggggcagn cgttattaaa      420
gttngttgnt aacnataaag tctacgtgat ctgagttag                          459

```

<210> 167

<211> 464

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(464)

<223> n = A,T,C or G

<400> 167

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gaattgggac caacganaan cntgcgntc ttnttttgcn tccanngccc agctnattgc      60
tcagacacac atggggaagg tnaaggtcgg gagtcaacng atttggtngt attgnagcgt      120
ttggtcacca gngctgcttt taactctggn aaagtggata ttgttgcac naatgacccc      180
tncattgacc tnaactacat ggtttacatg ttccaatatg attccacca tggcaaatc      240
catngcaccg tnaaggctga gaacgggaag cttgtnatca atggaaatcc catcaccatc      300
tttcangaac ganatccntn caaaaatcaa anttgggggc gatgcttggc cncttgaagt      360
accgttcaan gggaannncc ccactttggc cgntntttnc aanccaccc caatttgggn      420
aaaaaaaaag gggnnnttgg gggggggcct tttanntttt tttt                          464

```

<210> 168

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(462)

<223> n = A,T,C or G

<400> 168

ggcacgaggn	nnaacctncc	gggctggggc	agcacgcctt	gngcaancct	gcactgcact	60
gaagaccg	tgccggaagc	cgngggcngc	nacatgcagn	aactgaacca	gctgggcgcg	120
cancagttct	cagacctgac	agaggtgctt	ttacacttcc	taactgatcc	anantangtg	180
gaaatattnt	tngttnatnt	catntgaatn	atccancncc	aatcatanca	nntttnattn	240
cctcataanc	nttgagaana	gcnnccctnt	gnttncanan	ggtgctntga	anangagtct	300
cacangcaan	caggtccaag	cggatttntt	aactntgggt	cttantgang	agaaagncac	360
ttacttttct	gaaanengga	agcagaatgc	tcccaccctt	gctcgatggg	ccatacgtca	420
agactctgat	gattaaccag	ctttanatat	ggacnggaaa	tt		462

<210> 169

<211> 460

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(460)

<223> n = A,T,C or G

<400> 169

ggcacgaggg	acagcagacn	agacagtcac	agcagccttg	acaaaacgtt	cctggaactc	60
aagntcttnt	ncncaaagga	ggacagagca	nacagcagag	accatggant	ctncctcggc	120
ccctcccccac	agatggtgca	tcccctggca	naggctcctg	ctcacagcct	cacttctaac	180
cttctggaac	ccgcccacca	ctgccaagct	cactattgaa	tccacgccgt	tcaatgnntc	240
ntaggggaag	gaggngcttt	ctactnttnc	acaatctgan	ccccttcttn	tttggttact	300
ancatggctc	tncatgtnaa	aatactggna	tggntaacct	gtcaaattta	taggnantnt	360
gctaattggg	aaactnccnn	tngtctaccc	caggggnccc	agattcctnn	gttcncataa	420
cnattaattt	aaccccta	at	gncaanccct	tngttaaaga		460

<210> 170

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 170

ggcacgaggg	ggatttttag	gtggtcnggt	gtggatcag	gaataatgtg	ggaggccaga	60
ttgaagtcca	ggccaggaac	aatggtaatt	gtgggactta	agaaagtgtg	agtacagctg	120
aatgagccgg	ggagcagaaa	gtatatgcgt	caggtatgag	gaagaaaata	gattttggaa	180
gttatgagaa	atgtagagag	tgagttgagc	atagtttgtg	atthtgaggg	cctctaacag	240
tattaaagca	gcggcagcgg	ctgcacacag	acatgatggc	taggctaaaa	caggaagggtc	300
aagttgtttg	gacagaaagg	ctacagggtg	cagtcctggc	tcttgtgtaa	gaattctgac	360
cacactaacc	atgccttagga	aggaaaggag	ttgttctttt	gtaagggatt	gaggtttggg	420

agattaatcg gacacgatca gcagggagag cacctgtggt tttatgagaa ttatgctgag 480
 ataggttaaca gatgaggatg aaatttgg 508

<210> 171

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 171

ggcacgagac cagccactag cgcagnctcg agcgatggcc tatgtccccg caccgggcta 60
 ccagcccacc tacaaccgga cgctgcctta ctaccagccc atcccgggag ggctcaacgt 120
 gggaatgtct gtttacatcc aaggagtggc cagcgagcac atgaagcggg tcttcgtgaa 180
 ctttgtgggt gggcaggatc cgggctcaga cgtcgccttc cacttcaatc cgcggtttga 240
 cggctgggac aaggtggtct tcaacacggt gcagggcggg aagtggggca gcgaggagag 300
 gaagaggagc atgcccttca aaaaggggtg cgcctttgag ctggtcttca tagtcctggc 360
 tgagcactac aaggtggtgg taaatggaaa tcccttctat gagtacgggc accggcttcc 420
 cctacagatg gtcaccacc tgcaagtggg tggggatctg caacttcaat caatcaactt 480
 catcggaggc cagcccctcc ggcccca 507

<210> 172

<211> 409

<212> DNA

<213> Homo sapien

<400> 172

ggcacgagct ggagtgtctg ctgccacccc ctcgctctct gcagaaatgt ctgtcaccta 60
 cgatgactct gtgggagtgg aagtgtccag cgacagcttc tgggaggttg ggaactacaa 120
 acggactgtg aagcggattg acgatggcca ccgcctgtgt ggtgacctca tgaactgtct 180
 gcatgagcgg gcacgcatcg agaaggcgtg tgcacagcag ctactgagt gggcccgacg 240
 ctggaggcag ctggtagaga agggaccaca gtatgggacc gtggagaagg cctggatagc 300
 tgtcatgtct gaagcagaga gggtagtgga actgcacctg gaagtgaagg catcactgat 360
 gaatgaagac ttgagaaga tcaagaactg gcagaaggaa gcctttcac 409

<210> 173

<211> 409

<212> DNA

<213> Homo sapien

<400> 173

ggcacgaggg cagctagagg aagagtccaa ggccaagaac gcactggccc acgccctgca 60
 gtcagctcgc catgactgtg acctgctcgc ggaacagtat gaagaggagc aggaagccaa 120
 ggctgagctg cagagggcca tgtccaaggc caacagcgag gtagcccagt ggaggacgaa 180
 atatgagacg gatgccatcc agcgcacaga ggagctggaa gaggccaaga agaagctggc 240
 tcagcgtctg caggatgctg aggaacatgt agaagctgtg aattccaaat gcgcttctct 300
 tgaaaagacg aagcagcgac ttcagaatga agtggaggac ctcatgattg acgtggagag 360
 gtctaattgct gcctgcgctg cgcttgataa gaagcagagg aactttgac 409

<210> 174

<211> 407

<212> DNA

<213> Homo sapien

<400> 174

ggcacgagcc	ggggcggggc	gcggcgctcc	ggctcgaggc	attcgagct	gcgggagccg	60
ggctggcagg	agcaggatgg	cggcggcggc	ggctgcaggc	gaggcgcgcc	gggtgctggt	120
gtacggcggc	agggcgctc	tgggttctcg	atgcgtgcag	gcttttcggg	cccgcaactg	180
gtgggttgcc	agcgttgatg	tggtagagaa	tgaagaggcc	agcgtagca	tcattgttaa	240
aatgacagac	tcgttcactg	agcaggctga	ccaggtgact	gctgaggtg	gaaagctctt	300
gggtgaagag	aaggtggatg	caattctttg	cggtgctgga	ggatgggccc	ggggcaatgc	360
caaatccaag	tctctcttta	agaactgtga	cctgatgtgg	aagcaga		407

<210> 175

<211> 407

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagct	tgcccgtcgg	tcgctagctc	gctcgggtgcg	cgctgtcccg	ctccatggcg	60
ctcttcgtgc	ggctgctggc	tctcgccctg	gctctggccc	tgggccccgc	cgcgaccctg	120
gcgggtcccg	ccaagtcgcc	ctaccagctg	gtgctgcagc	acagcaggct	ccggggccgc	180
cagcacggcc	ccaacgtgtg	tgctgtgcag	aagggtattg	gcactaatag	gaagtacttc	240
accaactgca	agcagtggta	ccaaaggaaa	atctgtggca	aatcaacagt	catcagctac	300
gagtgtgtc	ctggatatga	aaaggtcctt	ggggagaagg	gctgtccagc	agccctacca	360
ctctcaaacc	tttacgagac	cctgggagtc	gttggtatcca	ccaccac		407

<210> 176

<211> 409

<212> DNA

<213> Homo sapien

<400> 176

ggcacgagtg	gtgcaaaaac	gggaccatgc	cctcctggag	gagcagagca	agcagcagtc	60
caacgagcac	ctgcgcgcgc	agttcgccag	ccaggccaat	gttgtggggc	cctggatcca	120
gaccaagatg	gaggagatcg	ggcgcattct	cattgagatg	aacgggaccc	tggaggacca	180
gctgagccac	ctgaagcagt	atgaacgcag	catcgtggac	tacaagccca	acctggacct	240
gctggagcag	cagcaccagc	tcattccagga	ggccctcatc	ttcgacaaca	agcacaccaa	300
ctataccatg	gagcacatcc	gcgtgggctg	ggagcagctg	ctcaccacca	ttgcccgcac	360
catcaacgag	gtggagaacc	agatcctcac	ccgcgacgcc	aagggcac		409

<210> 177

<211> 408

<212> DNA

<213> Homo sapien

<400> 177

ggcacgaggt	ccaggtaact	gcaaaaacaa	tggctcagca	tgaagaactg	atgaagaaaa	60
ctgaaacaat	gaatgtagtt	atggagacca	ataaaatgct	aagagaagag	aaggagcagg	120
tttcaaaaat	ggcatcagtc	cgtcagcatt	tggagaaac	aacacagaaa	gcagaatcac	180
agttgttggg	gtgtaaagca	tcttgggagg	aaagagagag	aatgttaaag	gatgaagttt	240
ccaaatgtgt	atgtcgctgt	gaagatctgg	agaaacaaaa	cagattactt	catgatcaga	300
tcgaaaaatt	aagtgacaag	gtcgttgcc	ctgtgaagga	aggtgtacaa	ggtccactga	360
atgtatctct	cagtgaagaa	ggaaaatctc	aagaacaaat	tttgga		408

<210> 178

<211> 92

<212> DNA

<213> Homo sapien

<400> 178

ggcacgagaa gaaattaaga gctaaagaca aggagaaatga aaatatgggt gcaaagctga	60
acaaaaaagt taaagagcta gaagaggaga tg	92

<210> 179

<211> 411

<212> DNA

<213> Homo sapien

<400> 179

ggcacgagga gacacgacac ctataccaca gttctcagaa tgaattagct aagttggaat	60
cagaacttaa gagtctcaaa gaccagttga ctgatttaag taactcttta gaaaaatgta	120
aggaacaaaa aggaaacttg gaagggatca taaggcagca agaggctgat attcaaaatt	180
ctaagttcag ttatgaacaa ctggagactg atcttcaggc ctccagagaa ctgaccagta	240
ggctgcatga agaaataaat atgaaagagc aaaagattat aagcctgctt tctggcaagg	300
aagaggcaat ccaagtagct attgctgaac tgcgtcagca acatgataaa gaaattaaag	360
agctggaaaa cctgctgtcc caggaggaag aggagaatat tgttttagaa g	411

<210> 180

<211> 411

<212> DNA

<213> Homo sapien

<400> 180

ggcacgaggt tggtcggagc gggcggagcg agttagcagg gctttactgc agagcgcgcc	60
gggcactcca gcgaccgtgg ggatcagcgt aggtgagctg tggccttttg cgaggtgctg	120
cagccatagc tacgtgcgtt cgctacgagg attgagcgtc tccacccatc ttctgtgctt	180
caccatctac ataatgaatc ccagtatgaa gcagaaacaa gaagaaatca aagagaatat	240
aaagactagt tctgtcccaa gaagaactct gaagatgatt cagccttctg catctggatc	300
tcttggttga agagaaaatg agctgtccgc aggcctgtcc aaaaggaaac atcggaatga	360
ccacttaaca tctacaactt ccagccctgg gggtattgtc ccagaatcta g	411

<210> 181

<211> 411

<212> DNA

<213> Homo sapien

<400> 181

ggcacgaggc gggacagggc gaagcggcct gcgcccacgg agcgcgcgac actgcccgga	60
agggaccgcc acccttgccc cctcagctgc ccactcgtga tttccagcgg cctccgcgcg	120
cgcacgatgc cctcggccac cagccacagc gggagcggca gcaagtcgtc cggaccgcca	180
ccgcgctcgg gttcctccgg gagtgaggcg gccgcgggag ccggggccgc cgcgccggct	240
tctcagcacc ccgcaaccgg caccggcgct gtccagaccg aggccatgaa gcagattctc	300
ggggtgatcg acaagaaact tcggaacctg gagaagaaaa agggtaagct tgatgattac	360
caggaacgaa tgaacaaagg ggaaaggcct aatcaagatc agctggatgc c	411

<210> 182

<211> 411

<212> DNA

<213> Homo sapien

<400> 182

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ggcacgagcc gacatggagc tgttcctcgc gggccgcccg gtgctggtca ccggggcagg      60
caaaggtata gggcgccggc cgggtccaggc gctgcacgcg acgggcgcgc ggggtggtggc      120
tgtgagcccg actcaggcgg atcttgacag ccttgctccg gagtgcccgg ggatagaacc      180
cgtgtgcgtg gacctgggtg actgggaggc caccgagcgg gcgctgggca gcgtggggccc      240
cgtggacctg ctggtgaaca acgccgctgt cgccctgctg cagcccttcc tggaggtcac      300
caaggaggcc ttgacagat cctttgaggt gaacctgcgt gcggtcatcc aggtgtcgca      360
gattgtggcc aggggcttaa tagcccgggg agtcccaggg gccatcgtga a              411

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<210> 183

<211> 409

<212> DNA

<213> Homo sapien

<400> 183

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ggcacgagcc tacactctgg ccagagatac cacagtcaaa cctggagcca aaaaggacac      60
aaaggactct cgacccaaac tgccccagac cctctccaga ggttgggggtg accaactcat      120
ctggactcag acatatgaag aagctctata taaatccaag acaagcaaca aacccttgat      180
gattattcat cacttggatg agtgcccaca cagtcaagct ttaaagaaag tgtttgctga      240
aaataaagaa atccagaaat tggcagagca gtttgtctc ctcaatctgg tttatgaaac      300
aactgacaaa cacctttctc ctgatggcca gtatgtccc aggattatgt ttggtgaccc      360
atctctgaca gttagagccg atatcactgg aagatattca aatcgtctc              409

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<210> 184

<211> 410

<212> DNA

<213> Homo sapien

<400> 184

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ggcacgaggt cattccagca ccaacaggat ccaagccaga ttgattgggc tgcattggcc      60
caagcttga ttgcccagg agaagcttca ggacagcaaa gcatggtaga acaaccacca      120
ggaatgatgc caaatggaca agatatgtct acaatggaat ctggtccaaa caatcatggg      180
aatttccaag gggattcaaa cttcaacaga atgtggcaac cagaatgggg aatgcatcag      240
caacccccac acccccctcc agatcagcca tggatgccac caacaccagg cccaatggac      300
attgttctc cttctgaaga cagcaacagt caggacagtg gggaatttgc ccctgacaac      360
aggcatatat ttaaccagaa caatcacaac tttggtggac cacccgataa              410

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<210> 185

<211> 411

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(411)

<223> n = A,T,C or G

<400> 185

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ggcacgagca cagatgtagt tttctctgcg cgtgtgcgtt ttccctcctc ccccgccctc      60
agggccaacg gccaccatgg cgtattaggg gcagcagtgc ctgcggcagc attggccttt      120
gcagcggcgg cagcagcacc aggtcttgca gcggcaaccc ccagcggctt aagccatggc      180
gcttctcacg gcattcagca gcagcgttgc tgtaaccgac aaagacacct tcgaattaag      240
cacattcctc gattccagca aagcaccgca acatgaccga aatgagcttc ctgagcagcg      300
aggtgttggg gggggacttg atgtccccct tcgacccgtc gggtttgggg gctgaagaaa      360
gcctangtct cttagatgat tacctggagg tggccaagca cttcaaacct c              411

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<210> 186
 <211> 410
 <212> DNA
 <213> Homo sapien

<400> 186
 ggcacgagct tctagtcccg ccatggccgc tctcaccggg gacccccagt tccagaagct 60
 gcagcaatgg taccgcgagc accgctccga gctgaacctg cgccgcctct tccatgccaa 120
 caaggaccgc ttcaaccact tcagcttgac cctcaacacc aaccatgggc atatcctggg 180
 ggattactcc aagaacctgg tgacggagga cgtgatgcgg atgctggtgg acttggccaa 240
 gtccaggggc gtggaggccg cccgggagcg gatgttcaat ggtgagaaga tcaactacac 300
 cgagggtcga gccgtgctgc acgtggctct gcggaaccgg tcaaacacac ccatacctgg 360
 agacggcaag gatgtgatgc cagaggtcaa caaggttctg gacaagatga 410

<210> 187
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 187
 ctttcgtggc tcactccctt tcctctgctg ccgctcggtc acgcttgtgc ccgaaggagg 60
 aaacagtgc agacctggag actgcagttc tctatccttc acacagctct ttcaccatgc 120
 ctggatcact tcctttgaat gcagaagctt gctggccaaa agatgtggga attgttgccc 180
 ttgagatcta ttttccttct caatatgttg atcaagcaga gttggaaaaa tatgatggtg 240
 tagatgctgg aaagtatacc attggcttgg gccaggccaa gatgggcttc tgcacagata 300
 gagaagatat taactctctt tgcagtactg tgggttcagaa tcttatggag agaaataacc 360
 tttcctatga ttgcattggg cggctggaag ttggaacaga gacaatcatc gacaaatcaa 420
 agtctgtgaa gactaatttg atgcagctgt ttgaagagtc tgggaatata gatatagaag 480
 gaatcgacac aactaatgca tgctat 506

<210> 188
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 188
 gccacagagg cggcggagag atggccttca gcggttccca ggctccctac ctgagtccag 60
 ctgtcccctt ttctgggact attcaaggag gtctccagga cggacttcag atcactgtca 120
 atgggaccgt tctcagctcc agtggaaaca ggtttgctgt gaactttcag actggcttca 180
 gtggaaatga cattgccttc cacttcaacc ctcggtttga agatggaggg tacgtggtgt 240
 gcaacacgag gcagaacgga agctgggggc ccgaggagag gaagacacac atgcctttcc 300
 agaaggggat gccctttgac ctctgcttcc tgggtgcagag ctacagatttc aagggtgatgg 360
 tgaacgggat cctcttcgtg cagtacttcc accgcgtgcc ctccaccgt gtggacacca 420
 tctccgtcaa tggctctgtg cagctgtcct acatcagctt ccagcctccc ggcgtgtggc 480
 ctgccaaccc ggctccatt acccag 506

<210> 189
 <211> 399
 <212> DNA
 <213> Homo sapien

<400> 189
 ctggacagga gaagagcctg gctgctgaag gcagggctga cacgaccacg ggcagcattg 60
 ctggagcccc agaggatgaa agatcgaga gcacagcccc ccaggcacca gagtgtctcg 120
 accctgcccg accggctggg ctctgtaggc cgacatctgg cctttcccag ggcccaggaa 180

aggaaacctt	ggaaagtgt	ctaatacgctc	tagactctga	aaaacccaag	aaacttcgct	240
tccacccaaa	gcagctgtac	ttctctgcca	ggcaggggtga	gctgcagaag	gtgcttctca	300
tgctgggtga	tggaattgat	cccaacttca	aaatggagca	ccaaagtaag	cgttcccat	360
tacatgctgc	tgcggaggct	ggccacgtgg	acatctgcc			399

<210> 190

<211> 401

<212> DNA

<213> Homo sapien

<400> 190

cggcgacggt	ggtggtgact	gagcggagcc	cggtgacagg	atgttggtgt	tggtattagg	60
agatctgcac	atcccacacc	ggtgcaacag	tttgccagct	aaattcaaaa	aactcctggt	120
gccaggaaaa	attcagcaca	ttctctgcac	aggaaacctt	tgcaccaaag	agagttatga	180
ctatctcaag	actctggctg	gtgatgttca	tattgtgaga	ggagacttcg	atgagaatct	240
gaattatcca	gaacagaaaag	ttgtgactgt	tggacagttc	aaaattgggc	tgatccatgg	300
acatcaagtt	attccatggg	gagatatggc	cagcttagcc	ctggtgcaga	ggcaatttga	360
tgtggacatt	cttatctcgg	gacacacaca	caaatttgaa	g		401

<210> 191

<211> 406

<212> DNA

<213> Homo sapien

<400> 191

tggcagccta	agccgtggga	gggttccagt	cgagaatggg	aagatgaaag	acttcagatg	60
gaacagaaat	aaatgccttt	tttgacaaac	gcagcagtg	gtgcctctag	cttgcaagag	120
cgttactccc	cttcatagct	ttaaaagggt	ttcgcaactgc	gtgcagttag	agtagctaaa	180
tcttgtgtga	cgctccacaa	acacttgtaa	gaattttgca	gagaaagata	accgttgcca	240
cccaatgccc	cccacaggca	ttctactccc	cagtacctct	taggggtggga	gaaatggtga	300
agagttgttc	ctacaacttg	ctaacctagt	ggacagggtg	gragattagc	atcatccgga	360
tagatgtgaa	gaggacggct	gtttggataa	taattaagga	taaaat		406

<210> 192

<211> 316

<212> DNA

<213> Homo sapien

<400> 192

cccggggagg	ccctggtcat	aaaactttaa	attttactag	tgttacttaa	tgtatattct	60
aaaaagagaa	tgcagtaact	aatgccttaa	atgtttgata	tctgtttgtc	attacttttt	120
caaaattatt	tttttctgta	aagtataata	tataaaactt	cttgcttaaa	ttgaatttct	180
atattagtgg	ttaattgcag	tttattaaag	ggatcattat	cagtaatttc	atagcaactg	240
ttctagtgtt	ttgtgttttt	aaaacagaat	taggaatttg	agatatctga	ttatattttt	300
catatgaatc	acagac					316

<210> 193

<211> 146

<212> DNA

<213> Homo sapien

<400> 193

gaaacatgga	ctgcccccta	aattttgact	gtccataaaaa	cctattttctg	atttataata	60
tgctgctgta	taaagtgaca	ctagatgtac	cagctgagtg	tttaattctt	ccatcacaga	120
tcagatttga	gcattaacag	gtattt				146

<210> 194
 <211> 405
 <212> DNA
 <213> Homo sapien

<400> 194
 cggatgtgct cactgacatt ctactccaag tcggagatgc agatccactc caagtcacac 60
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 ctggcccagc acatccgtat acactcaggg gctaagccct acagttgtaa cttctgtgag 180
 aaatccttcc gccagctctc ccaccttcag cagcacaccc gaatccacac tgggtgataga 240
 ccatacaaat gtgcacaccc aggctgtgag aaagccttca cacaactctc caatctgcag 300
 tcccacagac ggcaacacaa caaagataaa cccttcaagt gccacaactg tcatcggggcg 360
 tacacggatg cagcctcact agaggtgcac ctgtctacgc acaca 405

<210> 195
 <211> 421
 <212> DNA
 <213> Homo sapien

<400> 195
 agaattcggc acgagctact ccttgcgcg cggcautccg cagcctttaa ggttcgcgcg 60
 ggggccaggc aagagttagc catgaagagc ctcaagtccc gcctgaggag gcaggacgtg 120
 cccggccccc cgctcgtctg cgccgcccgc gccagcgcg atgcagcaga ttggaataaa 180
 tatgatgacc gattgatgaa agcagcagaa aggggggatg tagaaaaagt gacgtcaatc 240
 cttgctaaaa aggggggtcaa tccaggcaaa ctagatytgg aaggcagatc tgtcttccat 300
 gttgtgacct caaaggggaa tcttgagtgt ttgaatgcc tccttatata tggagttgat 360
 attacaacca gtgacactgc agggagaaat gctcttcacc tggctgctaa gtatggacat 420
 g 421

<210> 196
 <211> 476
 <212> DNA
 <213> Homo sapien

<400> 196
 agaattgatc tatagattta atgcaatgcc tactaaaatc ccagtagcat tttttacagg 60
 catagacaat agacatagcc aaaacttatt ctaaaataca tatgaagatg cacaggccct 120
 agttatacaa tcttgacaaa gaagaataaa gtgggaagaa tctatttgat ttttaaggctt 180
 accatgtaac tacagtcac aagagagtgt ggtatcggca gacggtcaga catagacatc 240
 aatggaatgt aacagaggac ccagaaatag gccacacag atatgctcaa tggatatttg 300
 acaagcgtgc aaaacaattc aatggaagaa taagctttca aaaaaatggc gttggagcaa 360
 ccggacatcc ataggaaaaa atgaacccat acctaaacca taaaccttat ataaaaataa 420
 acacaaaatg aatcataggc ttaaatgtaa gctataaaac ttttagagaa aaacac 476

<210> 197
 <211> 503
 <212> DNA
 <213> Homo sapien

<400> 197
 tagccctcgg tgaagcccca gaccacagct atgagtcctt tcgtgtgacg tctgcgcaga 60
 aacatgttct gcatgtccag ctcaaccggc ccaacaagag gaatgccatg aacaaggctt 120
 tctggagaga gatggtagag tgcttcaaca agatttcgag agacgctgac tgtcggggcg 180
 tgggtgatctc tgggtgcagga aaaatgttca ctgcaggatg tgacctgatg gacatggctt 240

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cggacatcct gcagcccaaa ggagatgatg tggcccggat cagctggtac ctccgtgaca 300
tcatactcgc ataccaggag accttcaacg tcatcgagag gtgcccgaag cccgtgattg 360
ctgccgtcca tgggggctgc attggcggag gtgtggacct tgtcaccgcc tgtgacatcc 420
gggtactgtgc ccaggatgct ttcttcagg tgaaggaggt ggacgtgggt ttggctgccc 480
atgtaggaac actgcagcgc ctg 503

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<210> 198
 <211> 168
 <212> PRT
 <213> Homo sapien

<400> 198

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Pro	Lys	Glu	Glu	Thr	Val	Thr	Asp	Leu	Glu	Thr	Ala	Val	Leu	Tyr	Pro
			20					25					30		
Ser	His	Ser	Ser	Phe	Thr	Met	Pro	Gly	Ser	Leu	Pro	Leu	Asn	Ala	Glu
		35					40					45			
Ala	Cys	Trp	Pro	Lys	Asp	Val	Gly	Ile	Val	Ala	Leu	Glu	Ile	Tyr	Phe
	50					55					60				
Pro	Ser	Gln	Tyr	Val	Asp	Gln	Ala	Glu	Leu	Glu	Lys	Tyr	Asp	Gly	Val
65				70					75					80	
Asp	Ala	Gly	Lys	Tyr	Thr	Ile	Gly	Leu	Gly	Gln	Ala	Lys	Met	Gly	Phe
				85				90						95	
Cys	Thr	Asp	Arg	Glu	Asp	Ile	Asn	Ser	Leu	Cys	Met	Thr	Val	Val	Gln
			100					105					110		
Asn	Leu	Met	Glu	Arg	Asn	Asn	Leu	Ser	Tyr	Asp	Cys	Ile	Gly	Arg	Leu
		115					120					125			
Glu	Val	Gly	Thr	Glu	Thr	Ile	Ile	Asp	Lys	Ser	Lys	Ser	Val	Lys	Thr
	130					135					140				
Asn	Leu	Met	Gln	Leu	Phe	Glu	Glu	Ser	Gly	Asn	Thr	Asp	Ile	Glu	Gly
145				150						155				160	
Ile	Asp	Thr	Thr	Asn	Ala	Cys	Tyr								
				165											

<210> 199
 <211> 168
 <212> PRT
 <213> Homo sapien

<400> 199

His	Arg	Gly	Gly	Glu	Met	Ala	Phe	Ser	Gly	Ser	Gln	Ala	Pro	Tyr
1				5				10					15	
Leu	Ser	Pro	Ala	Val	Pro	Phe	Ser	Gly	Thr	Ile	Gln	Gly	Gly	Leu
			20					25				30		
Asp	Gly	Leu	Gln	Ile	Thr	Val	Asn	Gly	Thr	Val	Leu	Ser	Ser	Gly
		35					40				45			
Thr	Arg	Phe	Ala	Val	Asn	Phe	Gln	Thr	Gly	Phe	Ser	Gly	Asn	Asp
	50					55					60			
Ala	Phe	His	Phe	Asn	Pro	Arg	Phe	Glu	Asp	Gly	Gly	Tyr	Val	Cys
65				70					75				80	
Asn	Thr	Arg	Gln	Asn	Gly	Ser	Trp	Gly	Pro	Glu	Glu	Arg	Lys	Thr
			85					90					95	
Met	Pro	Phe	Gln	Lys	Gly	Met	Pro	Phe	Asp	Leu	Cys	Phe	Leu	Gln
			100					105					110	

Ser Ser Asp Phe Lys Val Met Val Asn Gly Ile Leu Phe Val Gln Tyr
 115 120 125
 Phe His Arg Val Pro Phe His Arg Val Asp Thr Ile Ser Val Asn Gly
 130 135 140
 Ser Val Gln Leu Ser Tyr Ile Ser Phe Gln Pro Pro Gly Val Trp Pro
 145 150 155 160
 Ala Asn Pro Ala Pro Ile Thr Gln
 165

<210> 200

<211> 132

<212> PRT

<213> Homo sapien

<400> 200

Gly Gln Glu Lys Ser Leu Ala Ala Glu Gly Arg Ala Asp Thr Thr Thr
 1 5 10 15
 Gly Ser Ile Ala Gly Ala Pro Glu Asp Glu Arg Ser Gln Ser Thr Ala
 20 25 30
 Pro Gln Ala Pro Glu Cys Phe Asp Pro Ala Gly Pro Ala Gly Leu Val
 35 40 45
 Arg Pro Thr Ser Gly Leu Ser Gln Gly Pro Gly Lys Glu Thr Leu Glu
 50 55 60
 Ser Ala Leu Ile Ala Leu Asp Ser Glu Lys Pro Lys Lys Leu Arg Phe
 65 70 75 80
 His Pro Lys Gln Leu Tyr Phe Ser Ala Arg Gln Gly Glu Leu Gln Lys
 85 90 95
 Val Leu Leu Met Leu Val Asp Gly Ile Asp Pro Asn Phe Lys Met Glu
 100 105 110
 His Gln Ser Lys Arg Ser Pro Leu His Ala Ala Ala Glu Ala Gly His
 115 120 125
 Val Asp Ile Cys
 130

<210> 201

<211> 120

<212> PRT

<213> Homo sapien

<400> 201

Met Leu Val Leu Val Leu Gly Asp Leu His Ile Pro His Arg Cys Asn
 1 5 10 15
 Ser Leu Pro Ala Lys Phe Lys Lys Leu Leu Val Pro Gly Lys Ile Gln
 20 25 30
 His Ile Leu Cys Thr Gly Asn Leu Cys Thr Lys Glu Ser Tyr Asp Tyr
 35 40 45
 Leu Lys Thr Leu Ala Gly Asp Val His Ile Val Arg Gly Asp Phe Asp
 50 55 60
 Glu Asn Leu Asn Tyr Pro Glu Gln Lys Val Val Thr Val Gly Gln Phe
 65 70 75 80
 Lys Ile Gly Leu Ile His Gly His Gln Val Ile Pro Trp Gly Asp Met
 85 90 95
 Ala Ser Leu Ala Leu Leu Gln Arg Gln Phe Asp Val Asp Ile Leu Ile
 100 105 110
 Ser Gly His Thr His Lys Phe Glu

115

120

<210> 202
 <211> 135
 <212> PRT
 <213> Homo sapien

<400> 202

Arg	Met	Cys	Ser	Leu	Thr	Phe	Tyr	Ser	Lys	Ser	Glu	Met	Gln	Ile	His
1				5					10					15	
Ser	Lys	Ser	His	Thr	Glu	Thr	Lys	Pro	His	Lys	Cys	Pro	His	Cys	Ser
			20					25					30		
Lys	Thr	Phe	Ala	Asn	Ser	Ser	Tyr	Leu	Ala	Gln	His	Ile	Arg	Ile	His
			35				40					45			
Ser	Gly	Ala	Lys	Pro	Tyr	Ser	Cys	Asn	Phe	Cys	Glu	Lys	Ser	Phe	Arg
	50					55					60				
Gln	Leu	Ser	His	Leu	Gln	Gln	His	Thr	Arg	Ile	His	Thr	Gly	Asp	Arg
65				70						75				80	
Pro	Tyr	Lys	Cys	Ala	His	Pro	Gly	Cys	Glu	Lys	Ala	Phe	Thr	Gln	Leu
				85				90						95	
Ser	Asn	Leu	Gln	Ser	His	Arg	Arg	Gln	His	Asn	Lys	Asp	Lys	Pro	Phe
			100					105					110		
Lys	Cys	His	Asn	Cys	His	Arg	Ala	Tyr	Thr	Asp	Ala	Ala	Ser	Leu	Glu
		115					120					125			
Val	His	Leu	Ser	Thr	His	Thr									
		130				135									

<210> 203
 <211> 135
 <212> PRT
 <213> Homo sapien

<400> 203

Leu	Leu	Leu	Ala	Arg	Trp	His	Ser	Ala	Ala	Phe	Lys	Val	Arg	Ala	Gly
1				5					10					15	
Ala	Arg	Gln	Glu	Leu	Ala	Met	Lys	Ser	Leu	Lys	Ser	Arg	Leu	Arg	Arg
			20					25					30		
Gln	Asp	Val	Pro	Gly	Pro	Ala	Ser	Ser	Gly	Ala	Ala	Ala	Ala	Ser	Ala
			35				40					45			
His	Ala	Ala	Asp	Trp	Asn	Lys	Tyr	Asp	Asp	Arg	Leu	Met	Lys	Ala	Ala
	50					55				60					
Glu	Arg	Gly	Asp	Val	Glu	Lys	Val	Thr	Ser	Ile	Leu	Ala	Lys	Lys	Gly
65				70						75				80	
Val	Asn	Pro	Gly	Lys	Leu	Asp	Val	Glu	Gly	Arg	Ser	Val	Phe	His	Val
				85				90					95		
Val	Thr	Ser	Lys	Gly	Asn	Leu	Glu	Cys	Leu	Asn	Ala	Ile	Leu	Ile	His
			100					105					110		
Gly	Val	Asp	Ile	Thr	Thr	Ser	Asp	Thr	Ala	Gly	Arg	Asn	Ala	Leu	His
		115					120					125			
Leu	Ala	Ala	Lys	Tyr	Gly	His									
		130				135									

<210> 204
 <211> 167
 <212> PRT

<213> Homo sapien

<400> 204

Ala Leu Gly Glu Ala Pro Asp His Ser Tyr Glu Ser Leu Arg Val Thr
 1 5 10 15
 Ser Ala Gln Lys His Val Leu His Val Gln Leu Asn Arg Pro Asn Lys
 20 25 30
 Arg Asn Ala Met Asn Lys Val Phe Trp Arg Glu Met Val Glu Cys Phe
 35 40 45
 Asn Lys Ile Ser Arg Asp Ala Asp Cys Arg Ala Val Val Ile Ser Gly
 50 55 60
 Ala Gly Lys Met Phe Thr Ala Gly Ile Asp Leu Met Asp Met Ala Ser
 65 70 75 80
 Asp Ile Leu Gln Pro Lys Gly Asp Asp Val Ala Arg Ile Ser Trp Tyr
 85 90 95
 Leu Arg Asp Ile Ile Thr Arg Tyr Gln Glu Thr Phe Asn Val Ile Glu
 100 105 110
 Arg Cys Pro Lys Pro Val Ile Ala Ala Val His Gly Gly Cys Ile Gly
 115 120 125
 Gly Gly Val Asp Leu Val Thr Ala Cys Asp Ile Arg Tyr Cys Ala Gln
 130 135 140
 Asp Ala Phe Phe Gln Val Lys Glu Val Asp Val Gly Ileu Ala Ala His
 145 150 155 160
 Val Gly Thr Leu Gln Arg Leu
 165

<210> 205

<211> 381

<212> DNA

<213> Homo sapien

<400> 205

aaatttgagg tcatcgccgtg ttctgaaaac tagatgcacc aaccgtatca ttatttggtt 60
 gaggaaaaaa agaaatctgc attttaattc atgttggtca aagtcgaatt actatctatt 120
 tatcttatat cgtagatctg ataaccctat ctaaaagaaa gtcacacgct aaatgtattc 180
 ttacatagtg cttgtatcgt tgcatttgtt ttaatttggt gaaaagtatt gtatctaact 240
 tgtattactt tggtagtttc atctttatgt attattgata tttgtaattt tctcaactat 300
 aacaatgtag ttacgctaca acttgccctaa aacattcaaa cttgttttct tttttctggt 360
 gttttctttg ttaattcatt t 381

<210> 206

<211> 514

<212> DNA

<213> Homo sapien

<400> 206

aaaagtaaat tgcataaaat tacatccaat ttctttctct aaaccaacat attcttcacc 60
 ttcacaaagc aaacacatgg tgcactgaaa ccgaggtgtt accagcttta catactgttc 120
 tgccatttgt ggggggtgca accacaacat aagtcagaaa aaaagctatc cagcttttcg 180
 tggaatctgg tgaagtttac acttagcgat aagcctctaa gcctgaactt agcagggtta 240
 gcaaaacttt atttatttcc taactcctat tatttttagaa tggttttcaa aataatactg 300
 caagttccta attgaaatac aaaacagAAC aaaaagctgt gagaaatctt tttttttctt 360
 tggctcctta aagacttgga ataatttata ttagtggtgc atacatttta ccttctacat 420
 tttgatgtac ttgctcttga aagcactaga acaaattaat tgaaataaaa cctctctgaa 480
 accatttgaa tctttgatcc taccatagag tttt 514

<210> 207
 <211> 522
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(522)
 <223> n = A,T,C or G

<400> 207
 caagcttttg gtgcatagca gccngcctgg aagcattctg agtgctctgt ctgccctggg 60
 gggtttcatt atcctgtctg tcaaacaggc caccttaaatt cctgcctcac tgcagtgtga 120
 gttggacaaa aataatatac caacaagaag ttatgtttct tacttttatc atgattcact 180
 ttataccacg gactgctata cagccaaagc cagtctggct ggaactctct ctctgatgct 240
 gatttgcact ctgctggaat tctgcctagc tgtgctcact gctgtgctgc ggtggaaaca 300
 ggcttactct gacttccctg ggagtgtact tttcctgcct cacagttaca ttggtaattc 360
 tggcatgtcc tcaaaaatga ctcatgactg tggatatgaa gaactattga cttcttaaga 420
 aaaaaggagg aaatattaat cagaaagttg attcttatga taatatggaa aagttaacca 480
 ttatagaaaa gcaaagcttg agtttcctaa atgtaagctt tt 522

<210> 208
 <211> 278
 <212> DNA
 <213> Homo sapien

<400> 208
 aaaatgcact accccttttt tccaacacgg agcttaaaac aaattaatga aagagtggaa 60
 aattcaaaat aagggcaaga gataagggtt tttttttttt tcctttaaga tagactcagg 120
 ataggtagat agctttcact gatgtagatg tgguaataaat tactacttca ggaaaaaaat 180
 tcccaaacat cttatgaaaa agtatacaac tctacttcaa aatatgctat ttactcactg 240
 ccaaagacag ttttatttga aatcttggtt ctgtattt 278

<210> 209
 <211> 234
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(234)
 <223> n = A,T,C or G

<400> 209
 cctcccaaat ttagcagggtg ctgggnagga ccctagggag tggtttatgg gggctagctg 60
 gtgaaactgc cctttccttt ctgttctatg agtgatgatg tgtttgagaa aatgtggggc 120
 tatggttcag gcgcacttca catgtgcaaa gatggagaaa gcactcacct acacgtttag 180
 gctcagaatg ttgattgaaa cattttgaat gatcaaaaat aaaatgttat tttt 234

<210> 210
 <211> 186
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(186)
 <223> n = A,T,C or G

<400> 210
 aaaataactg atggcaaaat aaaanattta catcacatca tactgtgtaa acatgtaagg 60
 tctctgtaca aagaaatata catgcaaaat aatgtaaaaa tttaactgaa ataataaaaag 120
 aaacaatata caaataaaaa ttatgagggt acgaatacac atccagtttc gaatccaatt 180
 tctttt 186

<210> 211
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 211
 aaaaattggt aaaatattta agtacaaaat aagtagcttc cagcgagggt tttataccat 60
 agtaagagca cacaatagat attactagca cacatgggtt atctgggagc gctatagcta 120
 caataaacct aattatggaa cagaaatttg cattctgttt ccagtgtctac tacactccta 180
 ctttctcaaa agtctgtctt attaatatca gctcagtgcg gtttactatg aatagtttat 240
 gtctgtgatg caaagcatta attgttctct ttttacaac atacattttt ttcataagga 300
 agactggggg aaaaccaga aacatacaga gaaaaggaaa gcatcatcaa atatatgtta 360
 aaaattaaga tgatgtttac tactagtcac cctacaacaa ttt 403

<210> 212
 <211> 345
 <212> DNA
 <213> Homo sapien

<400> 212
 cctctttatg agttcattac tgctgttcag tctcggcaca cagacacccc tgtgcaccgg 60
 ggtgtacttt ctactctgat cgctgggcct gtggttgaga taagtcacca gctacggaag 120
 gtttctgacg tagaagagct taccctcca gagcatcttt ctgatcttcc accattttca 180
 aggtgtttta taggaataat aataaagtct tcgaatgtgg tcaggtcatt tttggatgaa 240
 ttaaaggcat gtgtggcttc taatgatatt gaaggcattg tgtgcctcac ggctgctgtg 300
 catattatcc tggtatttaa tgcaggtaaa cataaaagct caaaa 345

<210> 213
 <211> 318
 <212> DNA
 <213> Homo sapien

<400> 213
 aaaatgtttt attatattga aaataatggt gtaattcatg ccagggactg acaaaagact 60
 tgagacagga tggttattct tgtcagctaa ggtcacattg tgcctttttg accttttctt 120
 cctggactat tgaaatcaag cttattggat taagtatat ttctatagcg attgaaaggg 180
 caatagttaa agtaatgagc atgatgagag tttctgttaa tcatgtatta aaactgattt 240
 ttagctttac aaatatgtca gtttgcagtt atgcagaatc caaagtaa atgtcctgctag 300
 ctagttaagg attgtttt 318

<210> 214
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 214

aaacacatct	ggttctggca	gcaagttata	ttatgcattt	agagcaatag	gtgccctgaa	60
agttattggt	gctttttttg	tttttttttt	cagtttgtgc	gtgtcacttg	aatcagaaac	120
caaacacatg	taaaaaata	tcatectcaa	tgcccccat	taactctctc	tccagaagg	180
gacaatgtta	gtgaactcaa	gactctcact	gatgatggt	ttttacaatg	aaaacacaag	240
gaaacccttt	gaggtccaat	tttcacatca	tattctccaa	atagtaaaat	agcagctcta	300
catgttgatg	aaaagaaatt	tcaatttctt	cctatttggt	tttactcata	tcaacattaa	360
tatgtatctg	gatttattaa	tttccaaaaa	gaaaatttta	gttaccaaat	atttcagaaa	420
tttaataaag	cattatatat	atgtaattag	cacttatcta	cc		462

<210> 215

<211> 280

<212> DNA

<213> Homo sapien

<400> 215

aaacttttct	gaaacgatta	gctgtagcca	aattatgtgg	ttacgttttg	ctacattaga	60
atttgaaaat	gcaatatgtg	tggtaaatct	actgtttgaa	atttataatg	gtctctgata	120
tgattcgaat	tttggttaact	tttgaaagt	attttcccc	tttagtcatg	gatttctatt	180
tgttttttta	tgtttaattt	tctagaaagc	atctgaattg	actaggcttt	tcctatataa	240
aaaactcaaa	acttgtaaac	tctgtacttt	aataaaattt			280

<210> 216

<211> 210

<212> DNA

<213> Homo sapien

<400> 216

aaaatctctg	gcttcaaagt	ttcttgggga	aaggtcgggt	tacctcacat	tttttgtttc	60
cattagtaat	attctaggta	cctcacaaaa	tgtattatgg	tgccatggct	gttagttttt	120
agtgagtgtc	gtaggattaa	ttcgaaaata	ggcagaattc	cattcctccc	aaggaggcaa	180
aaattagcta	tactgatgta	attgtcattt				210

<210> 217

<211> 398

<212> DNA

<213> Homo sapien

<400> 217

ctggagctgc	tagaacttga	gatgagggca	agagcgatta	aagcccta	gaaagctggt	60
gatataaaaa	agccagccta	ggtatttaac	ttgattttga	attttaggta	tgtttgaaca	120
aagccacatc	atttaatttt	gtatctaaaa	tttatttggg	gtcttatatg	ttattttctca	180
tgtaaccctt	attaggactc	attttagccc	ttaattacct	gtggctggtt	ctttttattt	240
ttttgactac	ttttatatta	taaatgtgtg	ttactgtctt	atgaattcat	ggcaatatag	300
ttggatagcc	tggatacttt	gttagatgag	tatttagctg	tgtctgcaaa	tcttaaaagc	360
cattagcaaa	gagtcgtggt	atttttttct	ttattttt			398

<210> 218

<211> 487

<212> DNA

<213> Homo sapien

<400> 218

ctgccgccgg	tcaggctggt	taaagatcag	gtcccccagg	accttgcgat	ttatgtcgcc	60
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attctccagc aagacctcag tgccgaagac ctctacgatg cgccggtggg caggggatcc 120
tggtctgcacg acgtgccggg ccatcacgtc cacgtcaatc accgcacagc ccagttttag 180
tgtttttaca cattatattg ttataatctc acaataacta taaattaggt agaacaggaa 240
atgaggtttg gagaagatac ttgacttatc cgaccatctg tacttggtcc atagtaagga 300
gcctcaagca gagacaaagg aggaagttgc ctatgttgta tggtttacag gccataaatg 360
aatgtcatct ttttcctccc ctggggaaaa atgtctcaaa aatcccacca taggacatga 420
catctccaga acctctatta caaatacac atttctgtga gaggggtaac aaatttgggt 480
taacctg 487

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<210> 219

<211> 390

<212> DNA

<213> Homo sapien

<400> 219

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aaaaaataca ccacacgata caactcaata caggagtatt tcttctcaaa ttcttctagc 50
accatcaaca ttcttcaagt atctgaaata ctattaatta gcacctttgt attatgaaca 120
aaacaaaaca aggaccttag ttcattctctg tctagggtcag cacctaacaa tgtggatcac 180
actcatggga aagtgttttg aggtagttta aacctttgga agtttgggtt ttaaacttcc 240
ctctgtggaa gatattcaaa agccacaagt ggtgcaaatt tttatgggtt ttatttttca 300
atttttattt tggttttctt acaaagggtg acattttcca taacagggtg aagagtgttg 360
aaaaaaaagt tcaaattttt gggggagcgg 390

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<210> 220

<211> 341

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(341)

<223> n = A,T,C or G

<400> 220

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aaaacaggca aagttttaca gagaggatac atttaataaa actgcgagga catcaaagtg 60
gtaaatactg tgaaatacct tttctnnnca aaaggcaaat attgaagttg tttatcaact 120
tcgctagaaa aaaaaaaaca cttggcatac aaaatattta agtgaaggag aagtctaacg 180
ctgaactnnn aatgaaggga aattgtttat gtgttatgaa catccaagtc tttcttcttt 240
tttaagttgt caaagaagct tccacaaaat tagaaaggac aacagttctg agctgtaatt 300
tcgccttaaa ctctggacac tctatatgta gtgcattttt a 341

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<210> 221

<211> 234

<212> DNA

<213> Homo sapien

<400> 221

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ccagggggaa ttgagggagg ctctaagcta ggggcactgc atggtgggac aggatggccc 60
cttgaggact gaaccctggg gagaagacaa acagtaataa taaaaacaaa taacaagtac 120
tttaagaatg gattgtatga cctatagtga cagatgacat cactaatact gaaagcttct 180
tatattaata attttggcaa aatgtcattt tgtaatatag tatatgcttt ccag 234

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<210> 222

<211> 186

<212> DNA

<213> Homo sapien

<400> 222

aaattttcat	tgagttgtcc	atctccagca	tatagggctt	caggagcaga	gcagaccttg	60
tttttagtgg	ttccatggga	taaaatggga	ttggaggagc	tagaagaatt	caggggtctgg	120
tcgaatctgc	cagtcttcct	gaaatatcga	aaatacacca	gggctgctat	atcagagcca	180
ccctgg						186

<210> 223

<211> 486

<212> DNA

<213> Homo sapien

<400> 223

ccataagcag	ataagtagca	gttcaactgg	atgtctctct	tctccaaatg	ctacagtaca	60
aagccctaag	catgagtggg	aaatcggttc	ttcagaaaag	acttcaaata	acacttactt	120
gtgcctggct	gtgctggatg	gtatattctg	tgatcatctt	cttcatggga	gaaacagccc	180
acagagctca	ccaacaagta	ctccaaaact	aagtaagagt	ttaagctttg	agatgcaaca	240
agatgagcta	atcgaaaagc	ccatgtctcc	tatgcagtac	gcacgatctg	gtctgggaac	300
agcagagatg	aatggcaaac	tcataagctgc	aggtggctat	aacagagagg	aatgtcttcg	360
aacagtcgaa	tgctataatc	cacatacaga	tcactggctc	tttcttgctc	ccatgagaac	420
accaagagcc	cgattttcaa	tggtgttact	catgggccag	ctctatgtgg	taggtggatc	480
aatgg						486

<210> 224

<211> 322

<212> DNA

<213> Homo sapien

<400> 224

aaatgttcac	tatgtcattt	agtgtccaac	tttacggata	ggttgactat	ctaaataggc	60
atTTTTtagtc	attaaaaaaa	aatctagtca	ccaggaggat	ccctataact	caaaataact	120
tgTTTTgtaaa	agaaaatttg	tttacttacc	cattagtaag	ttcctgcata	ttcattataa	180
gatggcaaat	caaacttttc	taggatgaag	acagcttatt	tttaagttgt	atagtcttag	240
ttggtttagg	gtctcaattt	taattaataa	aataacttgg	ttttatttgc	ttgtcctttt	300
gaattcctgt	tttaataatt	tt				322

<210> 225

<211> 489

<212> DNA

<213> Homo sapien

<400> 225

aaatgtagga	ataaaatggc	tggtcatctaa	gcacttttagt	aaaagagggt	tttacaataa	60
actaaggatt	gtagagcttc	cttctctttt	ttttctttt	tctttctttt	gttttacatg	120
aactcaactt	attcctaaca	tttgtctacc	tcaaagaaat	ttcaagatta	tttagataac	180
atggatatgt	gccaaatcct	ttgagctgtt	aagatgataa	tttcttgctt	tcctcctaca	240
tcttctcctc	ccactccctc	ctttgggtgt	aatattggct	tcccaattaa	gacctttttt	300
ttttttttcc	agtttggttt	agcttattat	aggttttgga	ggaactttgc	cattttgtaa	360
tctttcaaat	cattcttcac	ccttcttcac	atcagcttcc	tgcttttccc	agtgttttac	420
tgtaaatgtg	gtagcatatg	acaaatcttg	agctgacttt	cctcttcact	gatgtcatct	480
tgagctctt						489

<210> 226

<211> 398

<212> DNA

<213> Homo sapien

<400> 226

caagggccca ccgcagagca cacctatgct atggggagcc ctgctggcag ccccgagagc	60
catgccatgg cctgcaggag ccaggctcct gtgtggatga agtccctctt cctctgtgcc	120
ttgatccctt ggggggtgcct ttgggtcatct cttctgtcct ttctgtctc tgaaatagtc	180
atcactcccc ttgactctct ctgttcacgt cttctcagtc tgcagagtta acttctgttaa	240
ggagtttaat ctgggggttcc aagaaaacaa gttccttggt aacatagcac tgactttgca	300
acaatagaaa actaacaat gagcaacaat ataaagagta gaggtagttc tcattgggtg	360
taacttcaac ccattctgct tgtggttaga atttataa	398

<210> 227

<211> 535

<212> DNA

<213> Homo sapien

<400> 227

ctgtgcata gaaaatatgc taacatacaa cagtcaagtt taagcctgtg catagagaag	60
ataaagcact tatggtaact gcaaatggta acgagtcctt aagggttgta caacctagta	120
tgggtccata aggaaaaact gtagtagaaa tggttaggac aaacaataaa gtagaaacag	180
gggggaaact tgagaagaga agaaagaagc aagaaaaaaa gactttcaat tgtataaaat	240
tcacaaacca gtaaagtata aagacaccat ggagaaatgg ttaactctgc cccaaacacc	300
caacagcaaa caaaaccaga atgaataagc ctttggcaga caattttaga aatttgatg	360
ttacatttct caataattca caaacaatat attatatggt atatttataat taaatattgg	420
gaaaccaatg ttgtaaattt gatgcttata atgctttagc caatgagagc acaatgatat	480
caatcaagct aatgaatgc tgggtgtatc acaacagtcg tcatttatga aacaa	535

<210> 228

<211> 301

<212> DNA

<213> Homo sapien

<400> 228

aaacaataaa caccatcaac cttattgact ttattgtccc ttaaattata ttgactgttg	60
tgattccatc aagtttgtac actcttttct ctccctgttt tgcagcaaca aattgcgaag	120
tgcttttggt tgtttgtttt cgtttggtta aagcttattg ccatgctggt gcggctatgg	180
agactgtctg gaaggcttgg aatggtttat tgcttatggt aaaatttgcc tgatttctta	240
caggcagcgt ttggaaacct tttattatat agttgtttac atacttataa gcttatcatt	300
t	301

<210> 229

<211> 420

<212> DNA

<213> Homo sapien

<400> 229

aaagttgctt tgctggaagt ttttataagg aatctcagat taaaccttta gaagtttaat	60
tgacactagg aagccaaacc aaggctgact tcagactttg tttgtagtac ctgtgggttt	120
attacctatg ggtttatata ctcaaatacg acattctagt caaagtcttg gtaatataac	180
caatgttttc aaatgtatc tgatatacaa agagcagatt tttattgaac ttgtgcaata	240
actatattac catacaatat aaatattcat gaatagtttc ccaagtctgg agcgaccaca	300
tagggagaaa atgcaaatgt ctcaattttt gttcacaaaa gtatatttta tcaaatgtct	360
gtaagctgtg gatagcttaa aagaaaaaaa gtttcctgaa atctgggaaa caagacattt	420

<210> 230
 <211> 419
 <212> DNA
 <213> Homo sapien

<400> 230
 gtgaagtcct aaagcttgca ttccaccagc ttctacaata gccggccttat tactagagca 60
 gacagatagc accttcagca ctctgcttgt ggccacagc agtttttcgt aagtataggt 120
 cctcattata ttactaaaag cttgggggtcc accactagcc agtatgatga gcttgctttc 180
 ttggttgcca taagctaaaa ttgaaggca gtctgtcgta atagccaaga atttaacatt 240
 tgttttgttg agcaaggcaa ccattttctg cagcccacca gctaaacgca ctgccatttt 300
 agctccttct tgatgtaata aaagggttggt gagagttgta atggcataaa acaacacaga 360
 atccactggt gaaccaagca ttttcaccag ggcagyaatg cctccagact taaagatgg 419

<210> 231
 <211> 389
 <212> DNA
 <213> Homo sapien

<400> 231
 ttgttcagag ccctgggtgga tcttgcaatc cagtgcccta caaaggctag aacactacag 60
 gggatgaatt cttcaaataag gagccgatgg atctgtgggc ctttgggact catcaaagcc 120
 ttggtttagc attttgtcag ttttatcttc agaaattctc tgcgattaaq aagataattt 180
 attaaagggt gtccttccta cctctgtggg gtgtgtcgcg cacacagctt agaagtgcta 240
 taaaaaagga aagagctcca aattgaatca cctttataat ttaccattt ctatacaaca 300
 ggcagtggaa gcagtttcag agaacttttt gcattgcttat ggttgatcag ttaaaaaaga 360
 atgttacagt aacaaataaa gtgcagttt 399

<210> 232
 <211> 397
 <212> DNA
 <213> Homo sapien

<400> 232
 ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt 60
 cacagtggaa ctgaaggaag gctctacagc ccagcttata ataaacactg agaaaactgt 120
 gattggctct gttctgctgc gggaactgaa gcctgtcctg tctcaggggt aacctgctta 180
 catctggact ttagaatctg gcacacaaca aaagtgcctg gcattcacta ctgctgcctt 240
 tcatttataa taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct 300
 tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaatactt tccccctttt 360
 tgctttgcta accaaagagc atatatttta ctgtcag 397

<210> 233
 <211> 508
 <212> DNA
 <213> Homo sapien

<400> 233
 cgaggagtgc cttaagtgcg aggacctcaa agtgggacaa tatatttgta aagatccaaa 60
 aataaatgac gctacgcaag aaccagttaa ctgtacaaac tacacagctc atgtttcctg 120
 ttttcagca cccaacataa cttgtaagga ttccagtggc aatgaaacac attttactgg 180
 gaacgaagt gggtttttca agcccatatc ttgccgaaat gtaaatggct attcctacaa 240
 agtggcagtc gcattgtctc tttttcttgg atgggtggga gcagatcgat ttacacctgg 300
 ataccctgct ttgggtttgt taaagttttg cactgtaggg ttttgtggaa ttgggagcct 360
 aattgatattc attcttattt caatgcagat tgttggacct tcagatggaa gtagttacat 420

tatagattac tatggaacca gacttacaag actgagtatt actaatgaaa catttagaaa	480
aacgcaatta tatccataaa tattttttt	508

<210> 234
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 234	
aaatgttggg attcaaaacc aaagatataa ccgaaaggaa aaacagatga gacataaaat	60
gatttgcaag atgggaaata tagtagttta tgaatgtaaa ttaaattcca gttataatag	120
tggctacaca ctctcactac acacacagac cccacagtcc tatatgccac aaacacattt	180
ccataaacttg aaaatgagta ttttgcatac ctcagttcag gatatgtttt ttacaagtta	240
atcctaaagt cataaagcaa gaagctattc atagtacaag attttatttg ctaagcttta	300
caaattaaac tctaaaaaat tattacaatg atactgaaag atattttatt ggcctttt	358

<210> 235
 <211> 482
 <212> DNA
 <213> Homo sapien

<400> 235	
gaagaaagtc agatttacgc cgatgaatat gatagtgtaaa tggatttttg cgtaggtttg	60
gtctagggtg tagcctgaga ataggggaaa tcagtgaatg aagcctccta tgatggcaaa	120
tacagctcct attgatagga catagtggaa gtgagctaca acgtagtacg tgcgtgtag	180
tacgatgtct agtgatgagt ttgctaatac aatgccagtc aggccacctc cggtgaaaag	240
aaagatgaat ctaggggtc agagcactgc agcagatcat ttcattattgc ttccgtggag	300
tgtggcgagt cagctaaata ctttgacgcc ggtggggata gcgatgatta tggtagcgga	360
ggtgaaatat gtcgtgtgt ctacgtctat tccactgta aatatatggt gtgctcacac	420
gataaacctt aggaagccaa ttgatatcat agctcagacc atacctatgt atccaaatgg	480
tt	482

<210> 236
 <211> 149
 <212> DNA
 <213> Homo sapien

<400> 236	
cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagttag	60
ggcaacacca agaaggctct gcggagagac tccctgtggg ttggggcctg gcaggaacgg	120
tgctgttggg ctgtttatgg tctgtccag	149

<210> 237
 <211> 391
 <212> DNA
 <213> Homo sapien

<400> 237	
gaagctaaat ccaaagaaat atgaagggtg ccgtgaatta agtgatttta ttagctatct	60
acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaaccaaga agaagaagaa	120
ggcacaggag gatctctaaa gcagtagcca aacaccactt tgtaaaagga ctcttccatc	180
agagatggga aaaccattgg ggaggactag gaccatattg ggaattatta cctctcaggg	240
ccgagaggac agaatggata taatctgaat cctgtttaa tttctctaaa ctgtttctta	300
gctgcactgt ttatggaaat accaggacca gtttatgttt gtgggttttg gaaaaattat	360
ttgtgttggg ggaaatgttg tgggggtggg g	391

<210> 238
 <211> 374
 <212> DNA
 <213> Homo sapien

<400> 238
 aaaaaacaaa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
 atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaaataaaa 120
 acactcatgg atagttaaaa actgtcaaga ttaaaattta atagtttcat ttatttggtta 180
 ttttatttgt aagaaatagt gatgaacaaa gatccttttt catactgata cctgggttga 240
 tattatttga tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaat 300
 catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca ttgggaaaaa 360
 aaaaaaaaaa aaaa 374

<210> 239
 <211> 200
 <212> DNA
 <213> Homo sapien

<400> 239
 aaagatgtct ttgaccgcat atgtactgga aatttcaaac gtggatcttc ccaggttgta 60
 gtctttgtgt tatgatcaat gaagaagggc cggccgtttg gcgctatcct catttcccag 120
 ccgggtggca agaagctctg tgtgactttg tgtgtgggtt tgggggagtt gtaaggtgat 180
 ggctgtgggg actgtgggtt 200

<210> 240
 <211> 314
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(314)
 <223> n = A,T,C or G

<400> 240
 ctggtaaaact gtccaaaaca aggttccaaa taacacctct tactgattta ccctacccat 60
 acatatncca natagntttt gatcaaaaac atgaaatana tccacctgct tattttaagc 120
 atattaaaaa ggaaactaat tggaccattt tctatttgct tattttatac aaaaaggcta 180
 cacaattgat acactctatt cagataacaa tcaattagag tgantatgaa ttactggcga 240
 caccatcact caattcttaa aaattagaaa ttgctgtagc agtattcact ataacttaac 300
 actaccgaga gact 314

<210> 241
 <211> 375
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(375)
 <223> n = A,T,C or G

<400> 241

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ccaagtcctt ggagttatag gatattcatt acttcctctc attgtaatag cccctgtact      60
tttggtggtt ggatcatttg aagtgggtgc tacacttata aaactgtttg gtgtgttttg      120
ggctgcctac agtgcctgct cattgttagt ggggaagaa ttcaagacca aaaagcctct      180
tctgatttat ccaatctttt tattatacat ttatcttttg tcgttatata ctgggtgtgtg      240
atccaagtta tacatgaata gaaaaagatg gtgttaaatt tgtgtgtagg ctgggaattc      300
tngctaagg aatggnaaaa aacctgtntt tgnaaaattn acntgtccca aagannaagga      360
anctaaacgc tttttt                                     375

```

<210> 242

<211> 387

<212> DNA

<213> Homo sapien

<400> 242

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aaaggcattc tctgatttac atgagaattg agaaactgag atgtatgatt tgtctgttag      60
tcaatttcac accctttcat tctcataagc cccaaatttt gctcagttaa ggagcttgct      120
ttaggccac ctatgtaagt ctgttatact agctaattgtg cccatttgaa tagttcaagg      180
gtcagctaat gctctgagct tcatggctcc agtataaaga acaaaatttaa caaaattaag      240
ctgttactgt agccgagtta cccttctgct ccacacatat gtagtgggat cttgcaggat      300
ttccatagtg ccaattatca aaggccttga ctacttagca ttgctgtatt acagatgtgc      360
aaactgaggc actgaaaagt caaattt                                     387

```

<210> 243

<211> 536

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (536)

<223> n = A,T,C or G

<400> 243

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aaacccaaag gacgaagaaa aaacactttn aaaaaaaaaa aaaaaaaaga aaaaccaaac      60
catattttgc cacatgtgag agtacggtca agcagtattt acaaaaaggt taacggaaca      120
acactctgac acatgctctg agaatactgg gactgctgtt tcaaaaaaaa aggttcaaac      180
ttattgtcac agcatcatca caaaatagag gatcaccatt ggtttgcttg gcttttcttt      240
ttttttttcc cccaagtgag gacctaactc caaataatac aatagaatat gcaaattatc      300
ttcacatcaa gagtacccca agaaaaacga aatccatggc acanacactg tacaaggggtg      360
cagggcaggg ctctgagggg cccaaacccc attttgccaa ctcgattttc tagcattgaa      420
gggagcaagg ggtcaggcat atgatggaga tgatactgaa atgattttat caaaatccat      480
gcaaatacaag ttctttggat agagggtgaan aacttggaca tggctgtttc aggcag      536

```

<210> 244

<211> 397

<212> DNA

<213> Homo sapien

<400> 244

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ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt      60
cacagtggaa ctgaaggaag gctctacagc ccagcttatc ataaacactg agaaaactgt      120
gattggctct gttctgctgc gggaaactgaa gcctgtcctg tctcaggggt aacctgctta      180
catctggact ttagaatctg gcacacaaca aaagtgcctg gcatccacta ctgctgcctt      240
tcatttataa taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct      300
tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaatactt tccccctttt      360

```

tgctttgcta accaaagagc atataatatta ctgtcag 397

<210> 245
 <211> 508
 <212> DNA
 <213> Homo sapien

<400> 245
 cgaggagtcg cttaagtgcg aggacctcaa agtgggacaa tatatttgta aagatccaaa 60
 aataaatgac gctacgcaag aaccagttaa ctgtacaaac tacacagctc atgtttcctg 120
 ttttccagca cccaacataa cttgtaagga ttccagtggc aatgaaacac attttactgg 180
 gaacgaagtt ggttttttca agcccatatc ttgccgaaat gtaaatggct attcctacaa 240
 agtggcagtc gcattgtctc tttttcttgg atggttggga gcagatcgat tttaccttgg 300
 ataccctgct ttgggtttgt taaagttttg cactgtaggg ttttgtggaa ttgggagcct 360
 aattgatttc attccttatt caatgcagat tgttggacct tcagatggaa gtagttacat 420
 tatagattac tatggaacca gacttacaag actgagtatt actaatgaaa catttagaaa 480
 aacgcaatta tatccataaa tattttttt 508

<210> 246
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 246
 aaatgttggg attcaaaacc aaagatatata ccgaaaggaa aaacagatga gacataaaat 60
 gatttgcaag atgggaaata tagtagttta tgaatgtaaa ttaaatcca gttataatag 120
 tggctacaca ctctcactac acacacagac ccacagtc tatatgccac aaacacattt 180
 ccataacttg aaaatgagta ttttgcataat ctacagttcag gatattgttt ttacaagtta 240
 atcctaaagt cataaagcaa gaagctattc atagtacaag attttatttg ctaagcttta 300
 caaattaaac tctaaaaaat tattacaatg atactgaaag atattttatt ggcctttt 358

<210> 247
 <211> 673
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(673)
 <223> n = A,T,C or G

<400> 247
 gaagaaagtt agatttacgc cgatgaatat gatagtgaat tggatttttg cgtaggtttg 60
 gtctaggggtg tagcctgaga ataggggaaa tcagtgaatg aagcctccta tgatggcaaa 120
 tacagctcct attgatagga catagtggaa gtgagctaca acgtagtacg tgcctgttag 180
 tacgatgtct agtgatgagt ttgctaatac aatgccagtc aggccaccta cgggtgaaaag 240
 aaagatgaat cctagggctc agagcactgc agcagatcat ttcattattgc ttccgtggag 300
 tgtggcgagt cagctaaata ctttgacgcc ggtggggata gcgatgatta tggtagcgga 360
 ggtgaaatat gtcctgtgtg ctacgtctat tcctactgta aatatatggt gtgctcacac 420
 gataaaccct aggaagccaa ttgatatcat agctcagacc atacctatgt atccaaatgg 480
 ttcttttttt ccggagtagt aagttacaat atgggagatt attccgaagc ctggtaggat 540
 aagaatataa acttcagggt gaccgaaaaa tcagaatagg tgttgggtata gaatggggtc 600
 tcctnctccg cggggctnaa gaaggtggtg ttgangttgc cggnctgtta ntagtatagn 660
 gatgccanca gct 673

<210> 248
 <211> 149
 <212> DNA
 <213> Homo sapien

<400> 248
 cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagtttag 60
 ggcaacacca agaaggctct gcggagagac tccctgtggg ttggggcctg gcaggaacgg 120
 tgccctgtgga ctgtttatgg tctgtccag 149

<210> 249
 <211> 458
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(458)
 <223> n = A,T,C or G

<400> 249
 gaagctaaat ccaaagaaat atgaaggtgg ccgtgaatta agtgatttta ttagctatct 60
 acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaacccaaga agaagaagaa 120
 ggcacaggag gatctctaaa gcagtagcca aacaccactt tgtaaaagga ctcttccatc 180
 agagatggga aaaccattgg ggaggactag gaccatcatg ggaattatta cctctcaggg 240
 ccgagaggac agaattggata taatctgaat cctgttaaat tttctctaaa ctgtttctta 300
 gctgcactgt ttatggaaat accaggacca gtttatgttt gtggttttgg gaaaaattat 360
 ttgtgttggg ggaaatgttg tgggggtggg gttgagttgg gggatatttc taattttttt 420
 tgtacatttg gaacagtgc aataaatgan accccttt 458

<210> 250
 <211> 374
 <212> DNA
 <213> Homo sapien

<400> 250
 aaaaaacaaa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
 atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaaataaaa 120
 aactcatgg atatgtaaaa actgtcaaga ttaaaattta atagtttcat ttatttgta 180
 ttttatttgt aagaaatagt gatgaacaaa gatccttttt catactgata cctggttgta 240
 tattatttga tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaaat 300
 catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca tttggaaaaa 360
 aaaaaaaaaa aaaa 374

<210> 251
 <211> 356
 <212> DNA
 <213> Homo sapien

<400> 251
 aaagatcttc tctaacaagc tatgggaatt tggcttcata ctctttcttt gcaacagcag 60
 tgttctgggt gataattttg aattgatacc tgttcctttt tctgggtttt gttggctttt 120
 tgaaaaattg tctttcctta tcattgggtg gaggccttgg agcaaagtaa catttttttg 180
 aaaagaggac agaaaaattg aactacagct tgagaacgta ttcttttttt cctactttgt 240
 tattgcaaat tgaggaatca cttttaactg ttttaggtgt gtgtgtccag agtgagcaag 300

gattatgttt ttggattgtc aaagaggatg cttagtctta aaataaaaaat aaattt 356

<210> 252

<211> 484

<212> DNA

<213> Homo sapien

<400> 252

ctggtaaact	gtccaaaaca	aggttccaaa	taacacctct	tactgattta	ccctacccat	60
acatatccca	aatagttttt	gatcaaaaac	atgaaataga	tccacctgct	tattttaagc	120
atattaaaaa	ggaaactaat	tggaccattt	tctatttgtc	tattttatac	aaaaaggcta	180
cacaattgtt	acactttatt	cagattacaa	ttaattagag	tgattatgaa	ttagtgttct	240
acaccattac	tcaattctta	aaaattagaa	attgctgtag	cagtattcac	tataacttaa	300
cactacgaga	gacttaaaaa	acagttactg	caaaaaaaaa	aaagagctac	ttcaaagcaa	360
gcaaagtcag	taccattaca	gatattctta	aaaaaaaaaa	aaaatttaac	aagcaaggct	420
agggtttgat	aaattccatc	ttgtgatcca	ttcttgtgca	ttcttcactt	cttgagtcac	480
tccc						484

<210> 253

<211> 379

<212> DNA

<213> Homo sapien

<400> 253

aaaaagcgct	tagacttccc	tttccatctg	gaacatgtaa	aattttgcag	caacagggtt	60
tctccaattc	cttcagcaag	aattcccagc	ctacacacaa	atttaacacc	atcttttctt	120
attcatgtat	aacttggatc	acacaccagt	atataacgac	aaaagataaa	tgtataataa	180
aaagattgga	taaatcagaa	gaggcttttt	ggtcctgaat	tcttcaccca	ctaacaatga	240
agcagcactg	taggcagccc	aaaacacacc	aaacagtttt	ataagtgtag	acaccacttc	300
aatgatcca	accaccaaaa	gtacaggggc	tattacaatg	agaggaagta	atgaatatcc	360
tataactcca	aggacttgg					379

<210> 254

<211> 387

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(387)

<223> n = A,T,C or G

<400> 254

aaatttgact	tttcagtgcc	tcagtttgca	catctgtaat	acagcaatgc	taagtagtca	60
aggccnttga	taattggcac	tatggaaatc	ctgcaagatc	ccactacata	tgtgtggagc	120
agaagggtaa	ctcggctaca	gtaacagctt	aattttgtta	aatttgttct	ttatactgga	180
gccatgaagc	tcagagcatt	agctgaccct	tgaactattc	aaatgggcac	attagctagt	240
ataacagact	tacataggtg	ggcctaaagc	aagctcctta	actgagcaaa	atttggggct	300
tatgagaatg	aaaggggtgtg	aaattgacta	acagacaaat	catacatctc	agtttctcaa	360
ttctcatgta	aatcagagaa	tgccctt				387

<210> 255

<211> 225

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(225)
 <223> n = A,T,C or G

<400> 255
 aaatgtcttg tttcccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
 agcacctttg ataaaatata cttttgtgaa caaaaattga gacatttaca ttttctccct 120
 atgtggtcgc tccagacttg ggaaactatt catgaatatt tatattgtat ggtaatatag 180
 ttattgcaca agttcaataa aaatctgctc tttgtatgac agaatt 225

<210> 256
 <211> 544
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(544)
 <223> n = A,T,C or G

<400> 256
 ccttgcttaa agcccagaag tggtttaggc ntttggaaaa tctggttcac atcataaaga 60
 acttgatttg aaatgttttc tatagaaaca agtgctaagt gtaccgtatt atacttgatg 120
 ttgggtcattt ctcagtccta tttctcagtt ctattatttt agaaccragt cagttcttta 180
 agattataac tggtcctaca ttaaaataat gcttctcgat gtcagatttt acctgtttgc 240
 tgctgagaac atctctgcct aattttaccaa agccagacct tcagttcaac atgcttcctt 300
 agcttttcat agttgtctga catttccatg aaaacaaagg aaccaacttt gttttaacca 360
 aactttgttt ggttacagtt ttcaggggag cgtttcttcc atgacacaca gcaacatccc 420
 aaagaaataa acaagtgtga caaanaaaaa aacaaacctt aatgctactg ttccaaagag 480
 caacttgatg gtttttttta atactgagtg caaaaggnc a ccaaattcc tatgatgaaa 540
 tttt 544

<210> 257
 <211> 420
 <212> DNA
 <213> Homo sapien

<400> 257
 aaatgtcttg tttcccagat ttcaggaaac tttttttctt ttaagctatc cacagcttac 60
 agcaatttga taaaatatac ttttgtgaac aaaaattgag acattttacat tttctcccta 120
 tgtggtcgct ccagacttgg gaaactattc atgaatattt atattgtatg gtaatatagt 180
 tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacattt gaaaacattg 240
 gttatattac caagactttg actagaatgt cgtatttgag gatataaacc cataggtaat 300
 aaaccacag gtactacaaa caaagtctga agtcagcctt ggtttggtt cctagtgtca 360
 attaaacttc taaaagttaa atctgagatt cttataaaaa acttccagca aagcaacttt 420

<210> 258
 <211> 736
 <212> DNA
 <213> Homo sapien

<400> 258
 aaacaaaatg ctaaacttaa aaacattgtt ctgtcagttc ccaaattaaa tctacttaga 60

```

acaaaaacaa aaatttatag ctcggtcaca tactacttaa ataatatgtg tcaggcatct 120
ctaaaatcct ccatgttttc aagtatggaa atagaactca aatattccac aatacagtac 180
taaacagatg gagtatattg gaaagacttt gttgtcatat ggcacaatat taatattttg 240
ttgcttcaat acgttttgaa ataaatatca gatttttgtt tttttttcct aaaagaccaa 300
aattataatc tacattaaga taattctgac tgtgggtaag acttaagagt gtaaaataca 360
acatcaatat tttatcacia aagtaaagct ggtaacaaat tataaaagga gccagtactc 420
tactgagaca ggctcggaga ttaaagctca tcatgataga aatagtcata atggagctgt 480
ctgccataat ctgtggcttc actggtgaga aacaagtcag ggttttccag aatctcttct 540
tcagagagct ttttgtcacc attcaaattc atttcatcaa ttagatgaag cgctcctctc 600
tgtgcaatgc cctgattatt aggtctaccc aaggtaacag ctcttgggga tcaagcctgc 660
catcgttatc tttgtcataa tcattcaccc aatctgtctt tctcacaagt atcccattct 720
ggatcttcat ttgcag 736

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<210> 259

<211> 437

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(437)

<223> n = A,T,C or G

<400> 259

```

aaaaccatac tgaaatcatt taccaaataa cnaagatctt aatctaaaag atagtgaata 60
catcatcatc atgaaatctg gttttatgtg ctctatgaag tacttggaga attgcttttt 120
tatttttctt ttgctttatt aggtcacaca aaacagaatg aattagcaga aaaatgtatg 180
ttataaaaca gcatttacta cttcaattta atttttttta ctaacaattg tggacctttt 240
tgatgacact tatgtatggt ttttaataaat tatgtactta ttagtactta atgagccctt 300
cctgcctcaa tataaaatta ctaaacttgg agaattacag attttattgt aggccctgat 360
gttagtcact ttggagaagc taaaaatttg gaaatgatgt aattcccact gtaatagcat 420
agggattttg gaagcag 437

```

<210> 260

<211> 592

<212> DNA

<213> Homo sapien

<400> 260

```

tttttttttt gaaaaatata aaattttaat aaaggctaca tctcttaatt acaataatta 60
ttgtaccaag taattttcct taaatgaact ctttataatg cataatttac agtataagta 120
gaacaaaatg tcatgacaaa agtcattgag tacaagactt gtaataaaaa ggcataaaat 180
atatttatac ataaaccctt ttcaaaaaac aagggaaagc ttgagccctc aatatagggc 240
gacacacgga gcgggtgacc gtgcaggtag aggtactgta ctgatttaaa gtcaagcact 300
agagatagtg gattaatact cttttgccgt acactatata cagatgtata gtacaagtaa 360
caatggcaaa cagaatgtac agattaactt aacacaaaaa cccgaacatc aaaatgaagg 420
tgtgtggagg aaagggtgctg ctgggtctcc ctacaactgt tcatttcttt gtggggcagg 480
gggtagttcc tgaatggctg tgggtccaat actaatgtaa aacaaaaaca gaaacaaaaa 540
aaacaaggaa ctgtcatttc cacgaaagca cagcggcagt gattctagca gg 592

```

<210> 261

<211> 450

<212> DNA

<213> Homo sapien

<400> 261
 gtggcagggc ccagccccga accagacaag ggacccctca aggagcttca ttctagcatg 60
 agaaaattga gaagtaaacc agaaagttac agaattgtctg aaggggacag tgtgggagaa 120
 tccgtccatg ggaaaccttc ggtgggtgtac agatTTTTtca caagacttgg acagatttat 180
 cagtcttggc tagacaagtc cacaccctac acggtgtgtc gatgggtcgt gacactgggc 240
 ctgagctttg tctacatgat tctgagtttac ctgctgcagg gttggtacat tgtgacatat 300
 gccttgggga tctaccatct aaatcttttc atagcttttc tttctcccaa agtggatcct 360
 tccttaatgg aagactcaga tgacgggtcct tcgctaccca ccaaacagaa cgaggaattc 420
 cgcccccttca ttcgaaggct cccagagttt 450

<210> 262

<211> 239

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (239)

<223> n = A,T,C or G

<400> 262
 taactttgat gacaaaatct aaaattaaag anttagtctt aaaagcctat agtgacttgt 60
 ttacttgcac aaataatatt ttcacttagt acaggctatt aatataagta atgagaattt 120
 aagtattaac tcaaaaaaag atagaggctc caaacttttc taagaaatta atgcattttc 180
 aaagtaataa tataatcaat ctgttaagtc aaagtaattt catattcatt gccaaattt 239

<210> 263

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (376)

<223> n = A,T,C or G

<400> 263
 aaaaaaaaaa aaaaaaaatt cttgtngtt tnttagagga aaaaaagaaa aaccccaact 60
 tttancactg atactacata ttgctctgtt aaagaatttt ctctgccaaa aaaaagaaaa 120
 aacaaaaaaa cgcttaaagc tggagtttga cattctgctt tcagatgctg tctttttatt 180
 agtgagtgat gatggtttgc taataatcaa taggtaataa ttttttgtaa tcccatcaag 240
 tggctccata tgtttctgct ctctcgtgac tgtgttaatg ttttaactgt gtaccttaaa 300
 gccgaaatca gtaactatgc atactgtaac caaggtattg ggcttacaga gttgtttgtt 360
 gnataaagaa aatttt 376

<210> 264

<211> 207

<212> DNA

<213> Homo sapien

<400> 264
 aaatttagcat tccacaaata tacaggtaat ttaataatta ttgtgcatga atacatacac 60
 aatgcttata tatacaaatt ccagtttggt ttcattgtgt ggcaagggat ttgtatacaa 120
 tcataagctg tgttcatatt ggtccattg aatattcaca atacaaaagc acaaaaagaac 180
 cattgattta caaaaggaaa tctatttt 207

<210> 265
 <211> 388
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(388)
 <223> n = A,T,C or G

<400> 265
 naactgcact ttatttggtta ctgtaacatt nttttttaac tgatcaacca taagcatgca 60
 aaagncnct gaaactgctt ccaactgcctg ttgtatagaa atgggtaaat tataaagggtg 120
 attcaatttg gagctccttc cttttttata gcacttctaa gctgtgtgcg cgacacacac 180
 cacagaggta ggaaggacca cctttaataa attatcttct taatcgcaga gaatttctga 240
 agataaaact gacaaaatgc taaaccaagg cttttgatgag tcccaaaggga ccacagatcc 300
 atcggctcct atttgaagaa ttcacccct gtagtggtct agcctttgta gggcactgga 360
 ttacaagatc caccagggtc ctgaacaa 388

<210> 266
 <211> 616
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 266
 aaatacagag tcaaaagatg atttataaaa tntaaaacat tttctgcttg gccgtatttg 60
 aagacaagct gaatacatat ctatgttctg aataagtcca ctatggatat atataggaag 120
 agatatacat atatccatcc acagatacac acacacatat atatttctgc atgtatatat 180
 acataattct ttctatagtt acaggaaata cttcttctat aattctgatt ttgactccca 240
 tcctccacca ttactcacc cactcattac ctaaactctg gctttctttc ctatattgta 300
 aataatccat ccaaacttct agccagtaact gtcaggaggg ttcttgctcg agtgagctgt 360
 taatactatt ttccactgac aacttctgca catcgaggac acagtgtatc tgaagactcc 420
 gctgtatact tccaacaacg ggggcatttt tctttcgtag tcggcatgac aattacttta 480
 taggaagact cttcacgaat atcaccacct tctaagttga tgaggaattt ccctttaagc 540
 tcgattacat ctgcagtcac ctctcgtggt tcctgaccag taaagttgac tcagaagcca 600
 tcattaattc attcaa 616

<210> 267
 <211> 341
 <212> DNA
 <213> Homo sapien

<400> 267
 ccattatgta tgtattttct tgaaaaatac ttatttcagc tacttatttt taatagttac 60
 ttattcttgt tgtattgtca tttgagtttt gtatatattt ttgatattaa ccccttgta 120
 catgtataat ttgcaaatat tttctccctt tttttagttg tcacattctg ttcattgtat 180
 cagattctgt gcagcagctt ttttaattga agtgatctga ctgacttggt cttccttttg 240
 tgtcctggga tatttaggtt aaatcaaaaa acttgctgcc cagaccaatg ttatggggct 300
 ttcactctat tttttggtag tagtagttta agagtttttag g 341

<210> 268
 <211> 367
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(367)
 <223> n = A,T,C or G

<400> 268
 ttgtagattg gaatagcaaa agtgaatgct ntgacaaaaa tttttgccct cctaaataaaa 60
 gacgtntcct tctagagagc aaatctatca taaaatgtca aaactagaag agaataaaaat 120
 gaaaggaaaa aacctagaaa aatatectaa aatatcaaatt gcagtcattt ctaaataataa 180
 gccataatta tagctttacc tattgtttctt attgttccta tgctgcttct acaatgttac 240
 atcaactata cttagcttta ctctcccaaa atcttggtga tgaagccttc tgagtgtgct 300
 ttccaatgtg ccagaaccag aagggcattc caaggcttcc ccacatttcc tccatttacg 360
 gagacag 367

<210> 269
 <211> 270
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(270)
 <223> n = A,T,C or G

<400> 269
 caaatctctc cctcactaga cgtaagccnt ttntctactc tctcaatctt atgcatcata 60
 gnaangcngn tgaggtggat taaaccaaac ccagctacgc aaaatcttag catactcctc 120
 aattaccac ataggatgaa taatagcagt tctaccgtac aaccctaaca taaccattct 180
 taatttaact atttatatta tcttaactac taccgcatcc ctactactca acttaaaactc 240
 cagcaccacg accctactac tatntcgcac 270

<210> 270
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 270
 ctgaatcatg aataacacta tataatagag tntaaggaac acaagcatta gatgtgatcc 60
 ttgccccata cccttagatt atgtcagact aaagctgaca attctgccag gctctgaacc 120
 cctagtgtcc ccaacccaaa tcttgggaagc aaagaatatg ccctgtcata caactttgta 180
 caagttgtag taaaacaaag cttaagtttt ctcatctttc tacagcaaatt ggtcagttat 240
 ttaataaaca ctaaaatgct cctaagaatc cattttgagt ttgtttacca aacacattgt 300
 gcaagaactg actacacaaa aagttccttt gaaatttggt ccacaaattc acttaagggt 360
 ggaaattt 368

<210> 271
<211> 313
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(313)
<223> n = A,T,C or G

<400> 271
aaatttatat aaaactctgt acatgttcac tttattattg cataaacagc ataatcttca 60
agacaanngt ttgcaaacac atgtccaatt caggaaaaaa aatttcacgt ttctcgtctg 120
gcttttttct tcttttttat ttgtttggga gattcccagc tagtttcaga ctgtggtctgt 180
gaaggaggca cactattttg cttggtattt gacttggatt tatctgtctc ttgtagtatt 240
ggcggcactt gggagagcct cttgtcagaa tcactttttg ataagattac agatggctcg 300
gtagaagtag cag 313

<210> 272
<211> 462
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(462)
<223> n = A,T,C or G

<400> 272
aaaaaacatt tattttaata agactattgc naacacatta aaaaaactaa atagtaatat 60
tacaaaatct atatacttgc acatttagta tttgtcaatg tgccagaggt ttcttctcatg 120
aaatttgact tctttgaagt gaaggctttt ttctatcatc tcttatagct ctgactgaat 180
aagtcttaat gctttcttca tgttttctat caataggggt aaatcccag gctcatatgt 240
gtacaatctg ttagagtatc ttccagctat gtcagctcta actgttaaag aagggtctac 300
aaacatgatt ctaggcacat attgcccac aggtgataaa ttcttatcag tggtttcatg 360
cataaggttt agcatgatga acttattctg agccatttct tgtatttctt cattttgggc 420
aaatactttc tttagtgtt gagagtattg acaatcctcc ag 462

<210> 273
<211> 282
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(282)
<223> n = A,T,C or G

<400> 273
ctgatcaaag catgggatat tttaatagtn ttatacataa tattttttaca tagaaaactt 60
tacatnncat ttcataattat ataattctgc ttattctttc aaaaatttat acatccattg 120
ggcaagggaat gggttttcatt aaattaccaa tattaaatgc acttaatcat tgtgtatagg 180
ttaaaccaaa gtaactatta actaactttt aggcatttta aggaggtaaa acatacattt 240
tacacataag tatttgatgc aaatatgcag ataaaatttt tt 282

<210> 274
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 274
 cagccctaga cctcaactac ctaaccaacn ttncctaaaa taaaatcccc actatgcaca 60
 ttnaatcnct ccaacatact cggattctac cctagcatca cacaccgcac aatccccctat 120
 ctagg 125

<210> 275
 <211> 528
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(528)
 <223> n = A,T,C or G

<400> 275
 aaagctgtgg aaaagcttta ttatagattt ttntacagaa ttaaaaaagt tcaaacaata 60
 ataagcngg aaccacaaat aattaaaagg aaacacagca atcccataaa caagcattct 120
 ggcattctgtt agaaatttttc cctcaaatta tgaaatgtag ctctccatgc tttccaatga 180
 ttgttataat acccacaat atctgtgatt tcragtggaa actttaacaa aagttttctt 240
 ttttaaggcat gatcctgatt cattttttct tcaatatctc agtcatttca ggaactacct 300
 taaataaatc tgcaactatt ccataatctg ccacttgga aattggagct tctgggtctt 360
 tattaattgc cacaattgtc ttgctgtctt tcatcccagc taaatgttgg atggctccag 420
 atattccaac agcaatataa agttctggtg ctactatttt tcccgctctgn ccaacttgca 480
 tgtcattggg aacaaagcca gcatcaacag cagcacggga agcaccaa 528

<210> 276
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(420)
 <223> n = A,T,C or G

<400> 276
 aaatgtcttg tttcccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
 agaaacctga taaaatatac ttttgtgaac aaaaattgag acatttacat tttctcccta 120
 tgtggctgct ccagacttgg gaaactattc atgaatatatt atattgtatg gtaatatagt 180
 tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacatct gaaaacattg 240
 gttatattac caagactttg actagaatgt cgtatttgag gatataaacc cataggtaat 300
 aaaccacag gtactacaaa caaagtctga agtcagcctt gggttggctt cctagtgtca 360
 attaaacttc taaaagttaa atctgagatt ctttataaaa acttccagca aagcaacttt 420

<210> 277
 <211> 668
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(668)
 <223> n = A,T,C or G

<400> 277
 ccagggtggc tctgatatag cagccctggg ntattttcga tatttcagga agactggcag 60
 atngcaccag accctgaatt cttctagctc ctccaatccc attttatccc atggaaccac 120
 taaaaacaag gtctgctctg ctctgaagc cctatatgct ggagatggac aactcaatga 180
 aaattttaaag ggaaaaccct caggcctgag gtgtgtgcca ctacagagact tcacctaact 240
 agagacaggc aaactgcaaa ccatgggtgag aaattgacga cttcacacta tggacagctt 300
 ttcccaagat gtcaaaaacaa gactcctcat catgataagg ctcttaccct cttttaattt 360
 gtccttgctt atgcctgcct ctttcgcttg gcaggatgat gctgtcatta gtatttcaca 420
 agaagtagct tcagagggta acttaacaga gtatcagatc tatcttgta atcccaacgt 480
 ttacataaa ataagagatc ctttagtgca ccagtgact gacattagca gcattcttaa 540
 cacagccgtg tgttcaaag tacagnggtc cttttcagag ttggacttct agactcacct 600
 gttctcactc cctgttttaa ttcaaccag ccatgcaatg ccaaataata gaaattgctc 660
 cctaccag 668

<210> 278
 <211> 202
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(202)
 <223> n = A,T,C or G

<400> 278
 aaattgggtat cgacggcaac caggggaagn tnctaaactc ctaatctatt ctggatccaa 60
 ttngcnaagt ggggtcccat caagggttcag tggcagtggg tctgggacag atttcactct 120
 cacgatcagc agtctgcaac ccgaagattt tgcaacttac tactgtcaac agagttacat 180
 gtccccgtac acttttggac cc 202

<210> 279
 <211> 694
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(694)
 <223> n = A,T,C or G

<400> 279
 ctgtacttgg acaaaataag ttaattctat ttggttgctc attaaagttt tatgtggcta 60
 tgnaccact ggagctaaaa attggctttt aactgtttcc aaatcagaac tagcagagga 120
 gagaagtaaa taaagccaat ggcactccct tcagaggctc aaaatggtta gattttgatg 180


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cagatttaac cttagcgagt ttcagtcagt ccatttagat gatcctgtag gttcatacaa      240
atacactgaa ccgttggttt aacttctctt ccttcctcaa agtttatgat aaagagactc      300
atccctgtat tgggagtgac tgacataagt tcagatctgc tcagagtggc tggtaaggaa      360
cacttaaggt cagtcagaaa ataatacaac agacttctca tgtaagcacc gtgactcaca      420
actaagacac tggctgctaa tcctggaata ccgctgtctg aattaacttt agagctgtga      480
ttttttccta aaggaaatat ctctgccaaa gaagtttcca gacagntgct tgggagatcc      540
ttggggaaaa ctggtctttt tgatccggtt ctttcangan taggtngaca aaagaaatnc      600
aaaaaagnct atccacgcn tttntcacct gggcccagcg gnnctcctcc nggggggggn      660
aaacacangg gactcttccc ngggctngct tnng                                     694

```

<210> 280

<211> 441

<212> DNA

<213> Homo sapien

<400> 280

```

aaaaaacttc catgcaactt ctgggtttatt gtttggcaac tccacatgat aaaaaataa      60
aanacagccca accgagtttc ggaattaagt attcttctag taagtgatcc aaacttgtaa      120
tatttgccac aggactgact tatttattta ctagctagaa gctcttaagt tcacttgttt      180
atcagggcat atacagaagg gtttggttaa actcgatggt aactttacaa ctttctgacc      240
tggatgcata attctcaagt actgtatttc actgtgttgg tgtgtctgat ggaaatttcg      300
aggtgggtccc acaaaaaatat tttatgtagt gtgccttcaa agagaacccat ttatttctct      360
tcacttatcg tcccacaaag tcacatttgg tgggtggtcag ccaagtcgca tctggtctag      420
ttttactctt gtcccaattt t                                     441

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<210> 281

<211> 398

<212> DNA

<213> Homo sapien

<400> 281

```

aaatttggtta ggtctgaaga atctaaaact gttaatttaa cccttaactt gtgcctagaa      60
actacagcac atataaaata tgtaaacacc agcctgttgc tgtacttttc tgcttatatt      120
acagcctcaa atatttctca ttatcttgtc acttagttct tcatgtttct cttctgact      180
tttaataatg gtaataggaa aacaaaaccc aaagcttttc agaacttcag tgtgaggttt      240
cctattttga caagttaact tgtaaatact caggttttac gatgtataat ttaccttaata      300
gaccaaacta actcatggag atattttgaa ctattattta ggtacaaact ttataaagaa      360
tgtagtatg tcataaaata taacattaca gcttattt                                     398

```

<210> 282

<211> 226

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(226)

<223> n = A,T,C or G

<400> 282

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aaaacaatat tctctttttg aaaatagtat naacaggcca tgcataaat gtacagtgta      60
ttacnccaat atgtaaagat tcttcaaggt aacaaggggt tgggttttga aataaacatc      120
tggatcttat agaccgttca tacaatgggt ttagcaaggt catagtaaga caaacaagtc      180
ctatcttttt ttttggctgg ggtggggggcg cccaggccga ggctgg                                     226

```

<210> 283
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 283
 aaacaaaaat actcaagatc atttatatatt ttttggagag aaaactgtcc taatttagaa 60
 tttccctcaa atctgaggga cttttaagaa atgctaacag atttttctgg aggaaattta 120
 gacaaaacaa tgtcatttag tagaatattt cagtatttaa gtggaatttc agtatactgt 180
 actatccttt ataagtcatt aaaataatgt ttcacaaat gggtaaatgg accactgggt 240
 tcttagagaa atgttttttag gcttaattca ttcaattgtc aagtacactt agtcttaata 300
 cactcaggtt tgaacagatt attctgaata ttaaaattta atccattctt aatatattt 358

<210> 284
 <211> 288
 <212> DNA
 <213> Homo sapien

<400> 284
 aaaacttttg ttaagaaaaa ctgccagttt gtgcttttga aatgtctgtt ttgacatcat 60
 agtctagtaa aattttgaca gtgcatatgt actgttacta aaagctttat atgaaattat 120
 taatgtgaag tttttcattt ataattcaag gaaggatttc ctgaaaacat ttcaagggat 180
 ttatgtctac atatttgtgt gtgtgtgtgt gtatatatat gtaatatgca tacacagatg 240
 catatgtgta tatataatga aatttatgtt gctgggtattt tgcatttt 288

<210> 285
 <211> 629
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (629)
 <223> n = A,T,C or G

<400> 285
 cctaaaagca gccaccaatt aacaaagcgt ncanntcaa caccactac ctaaaaaatc 60
 ccaaacatat aactgaactc ctacacacca attggacca tctatcacc tatanaagaa 120
 ctaatgttag tataagtaac atgaaaacat tctctctgc ataagcctgc gtcagattaa 180
 aacactgaac tgacaattaa cagcccaata tctacaatca accaacaagt cattattacc 240
 ctactgtca acccaacaca ggcattgctca taaggaaagg ttaaaaaaag taaaaggaac 300
 tcggcaaadc ttaccccgcc tgtttaccac aaacatcacc tctagcatca ccagtattag 360
 aggcacgcgc tgcccagtga cacatgttta acggccgcgc taccctaacc gtgcaaagg 420
 agcataatca cttgntcctt aattagggac ctgtatgaat ggcttcacga gggttcagct 480
 gtctcttact ttttaaccagt gaaattgacc tgcccgtgaa gaggcnggca tgacacagca 540
 agacgagaag accctatgga gctttaattt attaatgcaa acagnaccta acaaaccaca 600
 caggtcctaa acttacccaa accctggca 629

<210> 286
 <211> 485
 <212> DNA
 <213> Homo sapien

<400> 286
 aaatgtactt gctcagctca actgcatttc agttgtatta tagtccagtt cttatcaaca 60

ttaaaaccta tagcaatcat ttcaaatact	ttctgcaaat tgtataagaa taaagttaga	120
attaacaatt ttattttgtg caacagtggg	atgttctgtc atggataatg tgcttgagtc	180
cctataatct atagacatgt gatagcaaaa	gaaacaaaca aaagccagga aaacactcat	240
tttcgccttg aatatgtaaa tgggattaat	tttgcctgt gccttatgtg gaaaggaact	300
tctttggttt tccttttttg ttctgggtgg	agcatgtgca ggagacatat catccaaaca	360
taaaccatta aaatgtttgt gggttgcttg	gctgtaattt tcaaagtagt taattgagga	420
caaagggtaa tgcagaagtg atagctttgg	tttgcctgag cttgttttaa gtggccttga	480
tattt		485

<210> 287

<211> 340

<212> DNA

<213> Homo sapien

<400> 287

cctggagtc aataaccacc cctcatacc	acacccctgtg catacaccag ccaagccttt	60
cctggctctg gaagggaaga gaaaaagac	gcaggccacc tgggggttct gcagcttttg	120
gtcagtcag ccttctatct tagctgcctt	tggcttccgc agtgtaaacc ttgcctgccc	180
ggaggcagga ggcccagctg gacctccag	ggccatgagc aggcagcagc catcttgccc	240
tcaagcttg ctttcccttg agtccctctc	tccctcggc tctagccaga ggtgtagcct	300
gcagatctag gaaggaaga gctggggagg	aggatgaagg	340

<210> 288

<211> 290

<212> DNA

<213> Homo sapien

<400> 288

aaacagtctc tctcgggtgt tctccttgct	aaactgttca tcccagtttc ctctgaaata	60
gacagcattc accagaacca gccttgctca	tggatccact gagcccggag agagcaactc	120
cgcaatttta ccttctgtct ttccagctac	ccagggtgtt atgtgttttc tggacttctc	180
tacggcgctg ataaagtcaa gctcctccat	ctctgcttgg tagaattttt ggcaggaatc	240
tctaaaagat gagaggaaat cacaagactt	ttcccccagg agcctgttgg	290

<210> 289

<211> 404

<212> DNA

<213> Homo sapien

<400> 289

ccaccacgc ttaggttccc atcacactga	tgactccggg tttggcgagc acaggagcgc	60
aaaccttttc acattctttc tgtgatccaa	atgtgttttc gttccacca caacctccat	120
accagaatct tgcacagctt ttgggtgttg	gatcatagta ccattttaat atgaaatccc	180
tgcaagtcc ttcgtctttc ggcaacttgc	atatatctgt ttcagtgaga gccaatgggt	240
ctgtgctcac cattagattg atggttgaac	tagaagctga ccttgctggc tgtggaggtg	300
ggggctgaga tttctttgta ctgaaacttc	cgtggtaggt ggctctgacc tgagacctca	360
ggtagcagac cacagccaca tggatatgtc	gccagcag cagg	404

<210> 290

<211> 384

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(384)

<223> n = A,T,C or G

<400> 290

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ccaggcgcctc cttgtcggca tcagggaggg tggccttgaa ctgctcatgg gctgtgggtca      60
gtccctggat ctectcaatg gtgtgcacaa tgaagggtgc ctgcagggtcc tccatggccc      120
cctccatcca gttgttgaag ggtgcagccc gcttggcata ctccaagtac agctgggtcaa      180
tgggtctccag cagtttctcg gtccgctcca gagcttccct tcgcttctga gttagggtccc      240
ccagattgtc cactgggtca cagatctttt ggcaacgggc gttgacactg ggtgagtcac      300
aatantccag ctcatgtagc tcctgtgcga tggcggcaat ctgctccaca cggtcctggg      360
gggcagccag gccactctcg aagg                                     384

```

<210> 291

<211> 278

<212> DNA

<213> Homo sapien

<400> 291

```

aaagtattatt ttactatatt ctttatcact ttattgtatc atcaccattg gtttcataat      60
gtaaatacta tatgttgaac aaattaaatg tcaaaatttt ttattaccat agtccatgtt      120
aatagtgggg ctttcagggtg tttagagatt ttttttgggt ttgttaacat tcattgcaaa      180
agtactagat ggtgtataac tctagagttg aatttttaagg gattccctaa tatgtatact      240
atctttttat ctgaagtaat aaataaacia tgatcttg                                     278

```

<210> 292

<211> 177

<212> DNA

<213> Homo sapien

<400> 292

```

ccttggcccg gtcattcttg tccagtttga taggttcagg aaattcgttg tacagctcca      60
cctccgtttc ctgcttaagt gcattccgtg caatcgtctg gaacgcctgc tccacgttga      120
tggcctcctt ggcactgggc tcaaagtagg gaatgttggt tttgctgtag caccagg       177

```

<210> 293

<211> 403

<212> DNA

<213> Homo sapien

<400> 293

```

aaaaagaagg acttaggggtg tcgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agttttcata tatcgagatg ttcgctcgtg      120
cagtactgtt ggtaaattga caatttatgt ggattttgca tgtaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaataactga ctcagtgtct      240
gcctttaaat ataaatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaaatagt aatgtgatgc tgatgctgtt aaccaaaggc cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttggt ttt                                     403

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<210> 294

<211> 305

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(305)

<223> n = A,T,C or G

<400> 294

aaagcaatct	ggcatgggtgt	cctgtagtga	agcagaggat	cataacataa	gtaaactctc	60
tatgggtgga	agttggagag	aaggacattt	tggctttgta	catgaaaaga	ctctccagat	120
agaaaacagat	tctgcccata	agtgaaataa	aatgctttgt	gggggtaatg	agtgacttat	180
agtattcagg	cagatgttac	ataactgcta	attaagtttc	cctggattga	ntttanncaa	240
anaattgaaa	gtngattttg	gtcangtgtc	agnaaactac	tgccataaaa	cccatatcnt	300
accca						305

<210> 295

<211> 397

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(397)

<223> n = A,T,C or G

<400> 295

cctatctggt	tggccttttt	gaagacacca	acctgtgtgc	tatccatgcc	aaacgtgtaa	60
caattatgcc	aaaagacatc	cagctagcac	gccgcatacg	tggagaacgt	gcttaagaat	120
ccactatgat	gggaaacatt	tcattcccaa	aaaaaaaaaa	aaaaaaaat	t!ctcttctt	180
cctgttattg	gtagtcttga	acgttagata	ttttttttcc	atgggggtcaa	aagggtaccta	240
agtatatgat	tgccgagtg	aaaaataggg	gacagaaatc	aggtattggc	agtttttcca	300
tttncatttg	tggnggaatt	tttaataataa	atgcggagac	gtaaagcatt	aatgcnagtt	360
aaaatgtttc	agtgaacaag	tttcagcggg	tcaactt			397

<210> 296

<211> 447

<212> DNA

<213> Homo sapien

<400> 296

ccatcctcga	tgttgaagtt	gtcgtggggc	ccgaagacgt	tgggtggggat	gacagcgggtg	60
aaggtgcagc	cgtactgctg	gaagtaggcc	ctgttctgca	cgtcgatcat	cctcttggca	120
tacgagtacc	caaaattgct	gttgtgggga	ggccattgt	ggatcatggg	ctcatctatc	180
gggtaggtcg	tcttgtcagg	gaagatacag	gtggacaggc	aggacaccac	cttgccggcg	240
cccacctcga	aggccgagtg	caggacgttg	tcgttcatgt	gcacgttttt	cctccagaag	300
tccaaattgt	atttgatatt	ccggaacagg	ccccccacca	ttgcagcaag	atggatgacg	360
tgtgtgagtt	ggaccttctc	aaacagggcg	cgggtctgtg	ctgtatccgt	gagatcggcg	420
tctttagagg	agacaaacac	ccagtcc				447

<210> 297

<211> 681

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(681)

<223> n = A,T,C or G

<400> 297

aaataacagc	atgtaaaata	ttaaaataca	agctttcaaa	aataaataca	taaataagta	60
gaaccctcgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcagggg	ccaccctgca	ggaagtgtca	180
atgatacgct	gataagcttc	ttacttctct	cctgtcagtt	gggtgtcccc	ctgtgatgag	240
aaaaggggta	ctggtgcagg	tgctaaggaa	ggctgtctct	ctgtcactct	gaagttgctt	300
ggaggggatg	ccccatgcag	actctctccc	agccctccac	tcagggaagg	tctgtctgta	360
cccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	cttttttttt	ttttcaagaa	420
agaagnggct	gnngactcaa	ctagattctt	ggtttgaaaa	agccaaaaca	tattggtcac	480
tgattgtcac	attgggttag	aaatgtccat	tcatgatctc	ccttaagctg	cacacaaccc	540
tatgaaataa	ctaccattat	ctaccctatt	ttgctaaagc	tcaaagagat	taaataatgt	600
tgacagggat	cttagccttg	aactcactga	aggngttact	gcaaagttct	gctcttcacc	660
aagaaggntt	acaggccaaa	g				681

<210> 298

<211> 353

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (353)

<223> n = A,T,C or G

<400> 298

cctggcctaa	gaccagacat	ttgaagaagg	ctccaggcag	ggaaaggaaa	ggagaggcca	60
gccccacnct	gnccctctcc	tgccccacg	tctccagcaa	cacaaggcgg	ccagtggacc	120
gtgaaccatt	tattttccaa	ctataaagaa	acctgtctct	tgagaaaana	cactgcccag	180
gngatgaagc	tccagccctt	ggaggtccaa	aacccagtc	aaactcagtc	ccttttagaaa	240
gctgtgtgtc	cttggaatg	annntcggnt	gtcanagcct	gggaagtgg	gggaagaacc	300
agccactctc	cctctctctg	tgcgattcca	gcgcncgttg	ggnccagatc	tgg	353

<210> 299

<211> 560

<212> DNA

<213> Homo sapien

<400> 299

aaagttcaag	gactaacctt	atattatttg	gaaaggggag	gaggaaggaa	atgatatggt	60
accagacac	tgggctaggc	tgcaacttta	tctcattta	tactcccage	tgtcatgtga	120
gaaagaaagc	aggctaggca	tgtgaaatca	ctttcatgga	ttattaatgg	atttaagagg	180
gcatcaatca	gctcaactca	agatttcata	atcattttta	gtatttagat	tgtgcctcaa	240
agttgtagta	cctcacaata	cctccactgg	tttctgtgtg	taaaaacctt	cagtgaagttt	300
gaccattgtg	ctcttggtct	ttgggctgga	gtaccgtgg	gagggagtaa	acactagaag	360
tcttttagtac	aaaactgctc	tagggacacc	tgggtattcc	tacacaagtg	atgtttatat	420
ttctcataaa	gagtcttccc	tatcccaagg	tcttcatgat	gccagtagcc	atatatgata	480
aattatgttc	agtataact	tagttatcag	aaatcagctc	agtggctctc	cccgccatga	540
ttcacatttg	atgagttttt					560

<210> 300

<211> 165

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(165)
 <223> n = A,T,C or G

<400> 300
 aaaaactaca taggggtgtg tgtgtgtgtg tatgtttatt ttatacacac atatttgtat 60
 attctaatat attactaagg caattttaat gaattaccat gtatataaaa aaatatctgn 120
 cacttggcac acagggttgt atgtatgtgt atatatatat gtatg 165

<210> 301
 <211> 438
 <212> DNA
 <213> Homo sapien

<400> 301
 aaaatatatg tattttaaaaa caaaaagcaa cagtaatcta tgtgtttctg taacaaattg 60
 ggatctgtct tggcattaaa ccacatcatg gaccaaatgt gccatactaa tgatgagcat 120
 ttagcacaaat ttgagactga aatttagtac actatgttct aggtcagttc aacagtttgc 180
 ctgctgtatt tatagtaacc attttccttt ggactgttca agcaaaaaag gtaactaaact 240
 gcttcacetc cttttgcgct tatttggaat ttttagttat agtgtttaac tggcatggat 300
 taatagagtt ggagttttat ttttaagaaa aattcacaag ctaacttcca ctaatccatt 360
 atcctttatt ttattgaaat gtataattaa cttaactgaa gaaaagggtc ttcttgggag 420
 tatgttgtca taacattt 438

<210> 302
 <211> 172
 <212> DNA
 <213> Homo sapien

<400> 302
 ccaaaacagg agtcctgggt gatatcatca tgagaccag ctgtgctcct ggatgggttt 60
 accacaagtc caattgctat ggttacttca ggaagctgag gaactggtct gatgccgagc 120
 tcgagtgtca gtcttacgga aacggagccc acctggcacc tatcctgagt tt 172

<210> 303
 <211> 552
 <212> DNA
 <213> Homo sapien

<400> 303
 ccagcctgtt gcaggctgct tcgtagcggg cgctgggtgc ggacttccct tcccgggtct 60
 ggatcttttc atcctaccag atgagaaagg gaatgagtga atggagtgc cccgcaccct 120
 gtcactttcc tgagacatga ctgccaggaa gaagagctgc tctgggtctc atcagggctg 180
 gcaggacaaa ctgaccagtg agtcagtagg cagagttcac actgaaaaag ggcacaaggg 240
 ctgtcccaca atgggaggaa atgggggtctc agaacttcta cttctctgaa aactaagaca 300
 caattgggac aaccaccacc cccgtgtgag atttctcacc tcgagacagg acaagatgaa 360
 gttcacggct tcttctgggg taaagacctt gaagagccca tcacaggcca acaaaatgaa 420
 cctacaacac caggagagaaa tataaacggg ttttaggccc aacaaaaaaa taâââataa 480
 aaaaagggcc tggagatgga gataaaataa atatttgtcc aactattcaa aggctaagggt 540
 ttttttttct tt 552

<210> 304
 <211> 601
 <212> DNA
 <213> Homo sapien

<400> 304

cctttgattc	ttggtagtag	attgcatgta	aaatgtttat	aagaagctac	ttttccttca	60
tgggaagaaa	ttcccacatg	agattcataa	attcttagac	tccgtggctt	ctttgggtccg	120
gaatgcttaa	actcatatga	gtgttctgga	tcccagtgta	tccaatcata	attcacatta	180
tcaccttcac	gaaccacata	ctttgcccac	ggtgaaatac	gatacaagat	ctctccgctt	240
ttactagtaa	taactacctt	taatttggat	ccatgaggca	cgagtacaga	tttattctgc	300
tttggaggga	tatacagctc	ccattttcca	taatccagtt	ttttgtatgg	gtacgaaaat	360
ggattccaac	cattaaaatc	tccagtaaga	aaaactcctt	ctgctcccgg	ggcccattct	420
ttgcagtata	aaccaccatc	agcacatctg	tggacgccaa	atgattcata	gcctctggaa	480
aacttatcaa	taccaccttc	attttctcca	atgttcttca	aaatttggct	aaactgctta	540
tacctgcgct	ggaagtccac	ggcgtagggc	ttcaagtacc	ggtcgatctc	caggagtctg	600
g						601

<210> 305

<211> 401

<212> DNA

<213> Homo sapien

<400> 305

aaataacagc	atgtaaaata	ttaaaataca	agctttcaaa	aataaataca	taaataagta	60
gaacctctgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcagggg	ccacctgca	ggaagtgtca	180
atgatacgct	gataagcttc	ttacttctct	cctgtcagtt	ggtgtctccc	ctgtgatgag	240
aaaaggggta	ctgttgcagg	tgctaaggaa	ggctgtctct	ctgtcactct	gaagtgtgctt	300
ggaggggatgt	ccccatgcag	actctctccc	agccctccac	tcagggaagg	tctgtctgta	360
ccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	c		401

<210> 306

<211> 313

<212> DNA

<213> Homo sapien.

<400> 306

aaactgacta	tggattcctt	gaaggctctg	cagttgttga	tgatggcgat	catgtactga	60
acgtagcagt	gaggtgctg	ccgattcctc	aggtgtctct	ctttatacag	ctgcgcttca	120
tctttatata	tgaggacaga	caggcttcgg	tcagacagca	ctaagggcaa	catggagctg	180
tttcaaatac	cacgtgacg	tcacgcctgg	cctgaaattt	cacatcacta	acatctgacc	240
ggatgagcct	ctaaaaataa	aacaatcttt	agacgatcca	gactaatgga	aggacagaga	300
ggttgattac	ttt					313

<210> 307

<211> 366

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(366)

<223> n = A,T,C or G

<400> 307

aaagatgctg	ntaatgaaca	ttacggacaa	ttcatgggtg	ggctagttgg	taacacttca	60
gctgattttt	cttatgagat	ggaaaaaaaa	aatcagccaa	gtaagggcac	atcttcactt	120
catttataag	tcagcatcca	aggtaaaaga	attctctgtt	ggacttgaca	tcaactccat	180


```

cctctgatac tcgcctactc tcttctcaaa gaagttagnt ctttccttcc antgaaatat    240
tctcataaaa gtcaaattgg ttctctactc tgaaaacctt gctaaaaccc aattccagca    300
taagtttgtc tgnacaaaac ncaatgnatt gcttcattaa antgcaattc atcccaatga    360
gcttcc                                     366

```

<210> 308

<211> 534

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(534)

<223> n = A,T,C or G

<400> 308

```

ccagctatca gctgatcgtc ttctgtctgg acgctcgtcc tgcttctgac atcaaaatct    60
tctgtctcaa agtcagagtc atccaactcc tcaggggtcc ttatcatcag cactgctttc    120
ctgatgtccc ggatgccatc atataccagg cgggaagcat cgataaactc attctcatcc    180
atgggctggg cagggtccga gctgagggct tccacggctg cttctacttg ctcagtaaaa    240
cgtggcatga ctgtgttggg gagcagctta gtggcttcca gaaccttctc tgtgtagact    300
cctggctcat agtcgtccat ctctgaggtg actacgtgaa tgacccgggc tgcccggcct    360
cgaattgcac cagctgtgcg gccaggccat ccacatcctt ctcttgagga gcaatgacac    420
atcttggtcac atcttccaaa atgtgattct ctgagacagc caagaagtca tcaatggaag    480
taatgncatc gacagcatct gtgagaacac cgacttggtt ttccattgnt cttt         534

```

<210> 309

<211> 164

<212> DNA

<213> Homo sapien

<400> 309

```

catactcctt acactattcc tcatcaccca actaaaaata ttaaacacaa actaccacct    60
acctccctca ccaaagccca taaaaataaa aaattataac aaaccctgag aacccaaatg    120
aacgaaaatc tgttcgcttc attcattgcc ccacaaatcc tagg                    164

```

<210> 310

<211> 131

<212> DNA

<213> Homo sapien

<400> 310

```

aaaaatcatt tatctttcgg tgcttcaaca tgatgccaaa caaaaatcta ctgaataaaa    60
atagcaagga agggaatcaa acatttataa gatatatatta ttatttttct gaccaaagtg    120
caatgatttt t                                     131

```

<210> 311

<211> 626

<212> DNA

<213> Homo sapien

<400> 311

```

cctatgtgcg ccagtttcag gtcacgaca accagaacct cctcttcgag ctctcctaca    60
agctggaggc aaacagtcag tgagagtggg ggctccagtc agaccgcca gatccttggg    120
cacctggcac tcaagcactt tgcacgatgt ctcaaccaac atctgacatc tttcccgtag    180

```

agcaacttcc	tgctccacgg	gaaagaggtc	gatggattta	cccctggacc	cataagtctg	240
ttcatcctgc	tgaagtcccc	tccccattgc	tccttcaagc	caaaactaca	ctttgctggt	300
tcctgtcccc	tctgagaaag	gggatatgaa	gctccttcct	ctatgtcctc	ccatcgagat	360
ctgttctggg	gatggagctt	ccaacttcct	cttgacagcag	gaaagaatgc	tgctcaccct	420
tctgtcttgc	agagtgggat	tgtgggaggg	attggcagcc	ttcttctcca	ccacctgtcc	480
agcttcctcc	tggtcagggc	tgggaccccc	aggaatatta	tggtgccgtg	tgtgtgtgtg	540
tgtgtgtgtg	tcttctttta	gggagcagga	gtgcatctgg	taattgaggg	tagatgttgt	600
gtgtgctggg	gaggggtcct	t.ctgtt				626

<210> 312
 <211> 616
 <212> DNA
 <213> Homo sapien

<400> 312						
aaaccaaaga	aattaagaaa	aaagacttca	ttgcttgaat	gacgcgaaca	gctgtctgag	60
tcacctagac	tttaacacca	cctggggccc	tgggaatgac	gctgacgaga	gatctgcaca	120
tagtaggcgt	gggctccaaa	tgtgtctcat	agctgacttc	acatcctcac	aagtcagcct	180
cagatatgac	ccaagggata	cgtaccatct	cttcttgaaa	cagcgtgtca	aattatatat	240
atgtatgcaa	aaaagagtaa	tgtactaagc	aaaccaagtt	tcgtcttttt	cttctgaatc	300
tggttttaat	gtgacctgtc	atccccatct	ttcgaattta	tgagctccat	cttctctaga	360
ctgttaactt	cttgaggaaa	acatgctatt	ttaccacctt	tcactgctga	atccctagcc	420
cttaagcaca	gtctctggca	cagaataaat	acgaaatgaa	tgagtgaatg	aatggatgga	480
tgggtgaaga	gaaaaggcaa	tgcacaagat	ttacctatca	aaatccacca	atggtcctta	540
aaaatggttt	tgtcagtaga	gatgctgaat	atattcatat	aatacattta	tttcaatact	600
attaagaatt	ctagtgt					616

<210> 313
 <211> 553
 <212> DNA
 <213> Homo sapien

<400> 313						
aaaaaatggc	agcattgtac	ttgaatcaga	aagcttactg	ggatttcctc	atcgaaagta	60
gagattgcag	ctaatacctag	taccttttgt	tagtaattac	ttaaggcaca	gtgcaaagtt	120
gaaggactgt	tttggtagaa	actcaagcca	gctacatgta	tgcttgccct	ggatatcctg	180
ctagagcaca	tgcgggtata	ataccgtatt	atacacaaca	agggcaccct	gttgtatctg	240
tgttacaatt	aaacatcagt	cccagaaagt	gaaccctagt	catttattat	aggtgccac	300
ctctgacttg	gaacaaaatg	ccactccatt	catgttcatt	tttgtcctgg	agaggattta	360
tttcctaaaa	gattctgaaa	gccaacaaat	caatgtagtt	cttcatagag	aacttaagag	420
taaggctcaa	aatggcctca	aatgggctt	cttgatgac	ttccaacagt	gactggcctt	480
ctcaacactg	cagatgtctg	agcactacca	taacctaacg	aagtgaggaa	ggaggaggca	540
aattggattt	ttt					553

<210> 314
 <211> 330
 <212> DNA
 <213> Homo sapien

<400> 314						
ccagcgactc	cagcgggtggc	agcaggcagt	gcacgtactc	tgggcctccc	accagggtag	60
tgaagggtcc	cagctgttct	gccagggccca	ggaggacctc	atcttcatca	tagatgggtat	120
ctgtaaggaa	aggcagaagc	tcacttcggg	tcctttcaac	cccaagggcc	aaggcgatgg	180
tggacagctt	cttgatgctg	ttgaggcgaa	gctgaacgtc	ctcattgcgg	agttcgtcta	240
tgagcaccgc	gatggggtac	agcgagtcgt	cgccgtcggc	cgccgccatc	ttggctccgt	300

ccctttcctg tcagactgcg gccagcgctg

330

<210> 315

<211> 380

<212> DNA

<213> Homo sapien

<400> 315

aaaaatgaca	ttgcgttttag	cttattgtaa	gaggttgaac	ttttgtattt	tgtaactatc	60
tttaagccct	tcagtttata	attcatataa	aatgcctttt	gtatttataa	taatcctatt	120
ttaatcagtg	catgaaattt	gcttttttaa	agttcatttg	aatgattatt	ccttcctctt	180
aaagaaatga	ttttggtaat	gttgagaggt	accttaccac	aaatcctaac	tgtaagtgtg	240
ttcatgggta	ttttcaaaag	aattatgact	cttcccaaaa	agaatcctaa	aaaacttgta	300
ataaacctat	aaagctgatt	tgcatattta	caaaattttg	aatagcaaat	ataggcaact	360
catatatgta	tataattttt					380

<210> 316

<211> 222

<212> DNA

<213> Homo sapien

<400> 316

aaactacaga	gggttttcca	gtatttattt	ccttttagttt	craaaagtaa	cgacttatat	60
taatgtttta	taaaagatag	tgatgaaaaa	aaggtaatgc	tgaaataaag	gcgcttttag	120
aaatatttaa	ggacaacata	aggtattaat	attggaaaaa	aactgtacat	attttcaagc	180
acaacactga	aatattgcag	cagtgtttta	ctgaattggt	tt		222

<210> 317

<211> 490

<212> DNA

<213> Homo sapien

<400> 317

ccttgaatga	gcgtggagag	cgattaggcc	gagcagagga	gaagacagaa	gacctgaaga	60
acagcgccca	gcagtttgca	gaaactgcgc	acaagcttgc	catgaagcac	aaatgttgag	120
aaactgccta	tcctgggtgac	tcttcttaag	agaaaactgaa	gagtttggtc	agcagttttt	180
acaagaattc	gggacctccg	cttgcttctt	tttttccaat	atttggacac	ttagagtggg	240
ttttgttttt	tcttttcaga	tgttaatgtg	aaagaaaggg	tgttgcattt	ttacatttcc	300
ctaagtatct	tgctaataaa	tgctacaata	gcacgggctt	cattttgggt	ttttgcctcc	360
tcccactgtg	tgtatgtgtg	tatatgtatg	ttttgaatat	gttttcttta	ttaaaaata	420
ttttttgtag	tttgaatatg	aaatttggac	caaatgataa	actgcgctga	gtctaaactg	480
gcaacatgta						490

<210> 318

<211> 340

<212> DNA

<213> Homo sapien

<400> 318

cctggagtcc	aataaccacc	ccctcatacc	acaccctgtg	catacaccag	ccaagccttt	60
cctgggtctg	gaaggggaaga	gaaaaaagac	gcaggccacc	tggggggtct	gcagtctttg	120
gtcagtccag	ctttctatct	tagctgcctt	tggtctccgc	agtgtaaacc	ttgcctgccc	180
ggaggcagga	ggcccagctg	gacctccgag	ggccatgagc	aggcagcagc	catcttggcc	240
tcaagcttgc	ctttcccttg	agtcctcttc	tccctcgggc	tctagccaga	gggtgtagct	300
gcagatctag	gaagagaaga	gctggggagg	aggatgaagg			340

<210> 319
 <211> 373
 <212> DNA
 <213> Homo sapien

<400> 319
 aaagatgctg ttaatgaaca ttacggacaa ttcattggtg ggctagtgg taacacttca 60
 gctgattttt cttatgagat ggaaaaaaa atcagccaag taagggcaca tcttcagttc 120
 atttagaagt cagcatccaa ggtaaaagaa ttctctgttg gacttgacat cactcccatc 180
 ctctgatact cgcctactct ctctctcaaag aagttagtct ttccttccag tgaaatattc 240
 tccataaagt caaatgggtt ctctactctg aaaaccttgc taaaaccag ttccagcata 300
 agtctgtctg ccacaaactc aatgtattgc ttcattagag tgcaattcat gccaatgagc 360
 ttcacaggca agg 373

<210> 320
 <211> 509
 <212> DNA
 <213> Homo sapien

<400> 320
 aaaaacaaaa ttaaattttc atttcaatta agaccctttt tggcattttg cttacttatt 60
 ctgccctttg gttaacagca tcagcatcac attactattt tatattgcat atatgtagca 120
 tttgcttctt taagttttca acatatcatt tatatttaaa ggcagacact gagtcagtat 180
 taatagatta actaaactgc actgtaattt agataaaaatt actgtgtctc actgtgtatt 240
 acatgcaaaa tccacataaa ttgtcattta accaacagta ctgcacgagc gaacatctcg 300
 atatatgaaa actgcatcat caattcaacg ttttgggtact tgaaactgca tcataaatgc 360
 aacattgtca tatgtgaaaa cgacacccta agtcttctt tttaaaaatg acattgcgtt 420
 tagcttattg taagagggtg aacttttcta ttttctaact atctttaagc tcttcagttt 480
 ataattcata taaaatgcct tttgtattt 509

<210> 321
 <211> 617
 <212> DNA
 <213> Homo sapien

<400> 321
 ccaaggcccc ttttgcagcc cacggctatg gtgccttctt gactctcagt atcctcgacc 60
 gatactacac accgactatc tcacgtgaga gggcagtgga actccttagg aaatgtctgg 120
 aggagctcca gaaacgcttc atcctgaatc tgccaacctt cagtgttcga atcattgaca 180
 aaaatggcat ccatgacctg gataacattt ccttccccaac acagggctcc taacatcatg 240
 tcttccctcc cacttgccag ggaacttttt tttgatgggc tcttctattt ttttctactc 300
 ttttcaggcg cactcttgat aaatgggtta ttcagaataa aggtgactat ggatataatt 360
 gagccctctg gtccagggtc cagtttacct aatattacct cagaaaggat atggagggaa 420
 gatgatcttt ttgccagggtc tgacttttct tctgtctccg ccctccatta acgtcagta 480
 cccttttagca gctgacggcc ccacgttcta ctccatgctt ggcttccttt ccaactagct 540
 ctttcatata ttttacttgc tagtatctcc attctctcta aagtagtggt tctttttgac 600
 cttaaactta aattttt 617

<210> 322
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 322

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aaaaagaagg acttaggggtg tctgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agttttcata tatcgagatg ttcgctcgtg      120
cagtactgtt gggttaaatga caatttatgt ggattttgca tgtaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaataactga ctcaagtgtct      240
gccttttaat ataaatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt .                        403

```

<210> 323
 <211> 298
 <212> DNA
 <213> Homo sapien

```

<400> 323
ccagaattag ggaatcagaa tcaaaccagt gtaaggcagt gctggctgcc attgcctggg      60
cacattgaaa ttggtggctt cattctagat gtagcttggt cagatgtagc aggaaaaatag      120
gaaaacctac catctcagtg agcaccagct gccttccaaa ggaggggcag ccgtgcttat      180
atttttatgg ttacaatggc acaaaattat tatcaaccta actaaaacat tccttttctc      240
tttttctctg aattatcatg gagttttcta attctctctt ttggaatgta gatttttt      298

```

<210> 324
 <211> 78
 <212> DNA
 <213> Homo sapien

```

<400> 324
ccatgggaag gtttaccagt agaatccttg ctagggtgat gtggggccata cattccttta      60
ataaaccatt gtgtacat                                     78

```

<210> 325
 <211> 174
 <212> DNA
 <213> Homo sapien

```

<400> 325
ccatcatggg caggaactcc gggaagtcaa tgggtccggt cccatctgca tccacctcat      60
tgatcatatc ctgcagctct gcttcagtg ggttctgtcc cagggatctc atcactgtcc      120
ccaactcctt ggtggtgata gtgccatctc catccttgtc aaagagggag aagg          174

```

<210> 326
 <211> 679
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(679)
 <223> n = A,T,C or G

```

<400> 326
aaaactgaaa tacctcttaa aataatttga tccccagcgt ttgctctttt tgaagtaacc      60
aacttactct taaaaaggat ggntgccaa atggaaagtc ttactgggtt ttcattgttaa      120
cctattcttt ggacataact atgaattttg tatacaatgc acttcatgaa aagtttgtggc      180
tccccagat tgcccacaag tgtgatcttg aagtcctaaa catttggtcca tgtaagcttc      240
aaaacagcgt taactgagtt attcaagtag cagtacttaa agatacaatt cttgaagcag      300

```

```
tttcaatggt ttctgatcca aataatcagt ttctgaacat tactacttca cataatagag 360
tccatcttca gtttcttctc actttctctt tcccttttgg gtttcctttt tgtggcctga 420
ggccaccagt tctttgggta ctatcaagat acttccatca tgggtacact ggagagcata 480
gtggttgga ttgactggcc taccttggtc atctcttaat ctactaaaaa tatcatgata 540
aaggctcatgc agtttctggt tcattatggt aatagctttg gtacattgtg cttgctctct 600
cttaanagtt tccttctttg cttgcaagtt acatacatca tcttctaaat tcaaaattat 660
gtccattttg gcgtttacc 679
```

<210> 327

<211> 619

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(619)

<223> n = A,T,C or G

<400> 327

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aaaataagtt actggtaaat ggagttgcat tctatagtca cttataaat attaacaaaa 60
tatttataac tggaaacctta atgaaatgta tcatcaaatc aggtaaaaagc aacttgctcg 120
cagttaccaa agcctanata cgcgttagat gcgccttttc cggcctgtgc gtctgctctg 180
gttctcttca ggcagcaaaag ctggggaagg aagctcaggc aggagcctcc ccgacgccac 240
aacggcacia gcagcagcta aagcaccgca ctttgcctca ctaacctttt acttaaatga 300
ggttttgcc aatccacatc tgyaaccgcg tcacacccat ttgcaaggat gtttgttctt 360
tgatgaaact gcactcttac tgcacatgag ggctttcatt gtaggacaag aggagagttc 420
gtttattttt gtaactgttt tacatgttcc gattagttaa tcggtagctt atgtcatttg 480
ctatgcctgn agncttctaa tctctcctta ctaaaacatt acttcaaatt tgaattgacc 540
cttggttata atttatttag ccgggatttg tgtgtcattg tagagcaact ctaattcaag 600
aatagtgaac acttttaag 619
```

<210> 328

<211> 132

<212> DNA

<213> Homo sapien

<400> 328

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aaatccaaat acaaaagcat agtctctgca agattttggt ctttgaattt cttgatattg 60
taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
agcatatgaa tc 132
```

<210> 329

<211> 854

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(854)

<223> n = A,T,C or G

<400> 329

```
ccttgaggta actattgcaa aatatacagt gtaagttcag tctgatggaa accccagatt 60
catcaaggat acaaatctac agtagcccaa tggcggtttc atagtgtata atttattatc 120
aataaaatta actccgttac aatcagcatt catttctctc aattaaaatt aagcataaac 180
```

cctaggtagt	aaccttctgc	acatatgtat	agctccgaat	ttcctcactg	ttcgtctggt	240
gcaaaaacaa	tattcaagct	tgtctgatta	tgcataatctt	ctttaatcat	atagattata	300
tatacaatag	acaagacagg	actatataga	taatggacag	acttaaatgc	ccgcattttt	360
aaggtggaga	aaatgatgaa	tctatgcatc	cccgagaaca	cttaaaatct	ttttttatct	420
cactgggaaa	ttcttacagc	tactttacaa	tcatagggtta	acagcctagt	tatacagaag	480
acatatcca	ctacagagct	atactctatg	caactgtttt	ttccccctcat	aaacaacctg	540
agttcaaat	gaattctatc	ttccacaatc	acaatgggtg	catcaccag	tacacagaag	600
tttgaatcac	aaaacataat	taccacaata	aaacacagt	ttcaagtatc	ttggcagagc	660
aatctgccgc	aaaactgca	aattaaatta	actacacaga	ctaaaaacta	tacagcctac	720
catcacagtt	gtgcattata	aaaaagggag	tttctttcct	ttggttttta	gtcaggaaca	780
gggtaggatt	ttttaccctc	nggcggggga	ccacgctaaa	ggggcgaaat	ttcttgccan	840
nataattccnt	tcac					854

<210> 330

<211> 299

<212> DNA

<213> Homo sapien

<400> 330

ccaatgaata	actgacttta	taatcctggg	caatcagctt	ttggcggggt	gtaagtgtt	60
ctcgacactt	ttcactcatg	gattcttcaa	atttatgggt	aaagaggcac	ttatacactc	120
tgcctcacc	agcttgtgta	ttttcacaaa	aacgctcccg	atcatctcgg	caagcaaat	180
ataaatgccg	gtctaagtga	aagtcacccg	atgacagctc	agccaccggg	agaatggctt	240
tcttgacagag	ttcagaaact	tgaatcttgg	gttctctttc	ttctgcttct	ttcaccagg	299

<210> 331

<211> 573

<212> DNA

<213> Homo sapien

<400> 331

aaagatatga	acagcttaat	tttccgtgtg	attatctaat	taaaaaagaa	aaacaaaaca	60
agcaaaatgt	tcaagttaaa	aaaaaaacat	accgggtgag	caatgcacta	aaattatcca	120
catgaaaaa	aatggctgtg	aatcttataa	accaacatag	catttcactg	tcaacaatgt	180
gaaaatttaa	tatcttctca	aacaggcata	agatgaagaa	gtgctatctt	tttaattgtaa	240
aaggaactta	tgtaatgtaa	aattacatta	taatttttca	ttccgaattg	acaaatgatt	300
tcaaaaaaca	ggatcaaagt	ttgactgcaa	atagtaatgc	aatataatct	cataaaaatc	360
cttcaatttc	tatttttttc	cttttctgta	gttgacatat	gaagaccact	tcaatttcta	420
aaaaagggaa	ccattccaat	tttccctccc	caagaaaatg	tctcacaatt	acaaagtaga	480
aaaacagccg	ttcataaatg	caaaaaaatt	ctgattttata	tatgaaataa	tttctagatc	540
aattcaacat	atttgatgac	atttgttgag	ttt			573

<210> 332

<211> 555

<212> DNA

<213> Homo sapien

<400> 332

aaatttgaaa	gttgtaagca	ctgatgttaa	tgtgattgat	cagcatgggc	atatgtaaaa	60
tgtccttttc	tgggtgcctc	tctatgctat	tgtgttcaga	tacttacacc	ataattaaac	120
agtaagtatt	agacttgctg	agtttggcat	agatagtgcg	ctcatttaat	ctgtgcctct	180
caaaacttca	gaatattagc	atattaccac	aaataatctt	tggtgaaact	attgagatat	240
taaaattttt	gaaatcacta	ctgttacctg	ttatagaaaa	tagtggtggc	ttagtctagt	300
ctctgtgtaa	ctggttacat	tttgatgggt	gtctatactc	aactggatat	gtgtatgtaa	360
attagaaaat	acatacctat	ccagacataa	atgctaagta	acattttttt	cttctcccaa	420

ctacataatt tgtagctcat catttttctt taatcctttc ctaacttgtc gcagcagttt	480
gaatttccca gatatttatg tttgaacata atggctcaga atacatatatt gaacatcata	540
gttgatatata ttttt	555

<210> 333

<211> 460

<212> DNA

<213> Homo sapien

<400> 333

aaatttcttt caacagtcta ttgggggtcca aaaagcatat atcaaaacaa aaataacaaa	60
agcaaaacaa aatgctacat gtaaaagcta aagaaagaaa atgcagcata ttcaggttct	120
ttttcttgag gtacctatat aaatttaatc acctgcccc aagtcctctc gttagggttaa	180
aaacacaatg cgtcctgggg agccaattgc ccggcacgtc ttattactga gaaagtgcga	240
gaatgctgat catcttatgc agcatactaa aggatgattt actctttaca aaatagagct	300
taagtatcaa cctgatggaa gttagaaaat taaaaacatt taagtagaat catctctctc	360
tctatttttg agatcctgca gcaaaaagcc tcccaaatca actttcaaag ttctgccatt	420
aaggaaatgtt ggttctcttg taaaattcag agatctcttt	460

<210> 334

<211> 190

<212> DNA

<213> Homo sapien

<400> 334

ccaaggaagg ctgtgctcta gcccatctga cctgtctctc aaaccacctg ggggacaagg	60
ctgatagaga cctgtgcaga tgtctctctc tgtgccccct actcatctca ctggatctgt	120
ctgccaaccc tgagatcagc tgtgccagct tggaagagct cctgtccacc ctccaaaagc	180
ggccccaagg	190

<210> 335

<211> 394

<212> DNA

<213> Homo sapien

<400> 335

aaatttggac agacttctag cggacagtta cttctcaaga attttctata caaaagctgt	60
gccaggcata tatttttctca ccaggacaca tggggcagcg gacccttggt gtcagtaaga	120
acacacccag aatgatataa ccagatattt ttcagtttct aaattaaggc atattcaaaa	180
aattccatgt acaagtttac accacttttc taagttactc accaggtaat taaagcagat	240
tcacagatga attactctca gtttaactat atgcaacaac catgccata acttttcttc	300
taaattttgc ataataatgg ttaaaaaaag tggtagttta actatcatgt tcacaattgt	360
catttttcaa ggcagtagaa gaccaagaca tttt	394

<210> 336

<211> 429

<212> DNA

<213> Homo sapien

<400> 336

aaaagctatc accattgtag tagaatcatc cttctttttt gaaatttgaa gcatcccagg	60
cttaaaatct tgtgtttcag aaagacagtt tataccatga ctgcttaatt atcccccaa	120
agacctcttg attgaagtca tgtacagttc agtggcctaa attctctgcc tttttaactt	180
gctttgcaag cctactctga aaataagtta tttagtcaag ttattctcaa agatgtccca	240
gttgccatga aaggatcaaa tggaacattt gacacacata ctcaaaaaaa tgtaactgac	300

tataaacact ttaacctaata catctgtatc aaacttttcta aaaatcaaata ctccaggattg 360
ttccactttta gagattcttat gtaaagtttta tataactata ctgtgtcaaata agcacctatc 420
tatgcattt 429

<210> 337

<211> 373

<212> DNA

<213> Homo sapien

<400> 337

aaagatgctg ttaatgaaca ttacggacaa ttcattggtg ggctagttgg taacacttca 60
gctgattttt cttatgagat ggaaaaaaaa atcagccaag taagggcaca tcttcagttc 120
atctagaagt cagcatccaa ggtaaaagaa ttctctgttg gacttgacat cactcccatc 180
ctctgatact cgcctactct cttcccaaag aagttagtct ttccttccag tgaaatatcc 240
tccataaagt caaatgggtt ctctactctg aaaaccttgc taaaaccag ttccagcata 300
agtctgtctg ccacaaactc aatgtattgc ttcacagag tgcaattcat cccaatgagt 360
ttcacaggca agg 373

<210> 338

<211> 366

<212> DNA

<213> Homo sapien

<400> 338

ccatccccctt atgagcgggc gcagtgatta taggcttttcg ctctaagatt aaaaatgccc 60
tagcccactt cttaccacaa ggcacaccta caccctttat cccatacta gttattatcg 120
aaaccatcag cctactcatt caaccaatag ccctggccgt acgcctaacc gctaacatta 180
ctgcaggcca cctactcatg cacctaattg gaagcgccac cctagcaata tcaaccatta 240
accttccctc tacacttatc atcttcacaa ttctaattct actgactatc ctagaaatcg 300
ctgtcgcctt aatccaagcc tacgttttca cacttctagt aagcctctac ctgracgaca 360
acacat 366

<210> 339

<211> 319

<212> DNA

<213> Homo sapien

<400> 339

ccttccctcc ccaccacat caacctcttc aaaacctact ccctccctct aagtatctct 60
caacacagta tgtctggggc tagatttcaa aaccacgta atgaaaaagt cagttttaca 120
agcctaattt tgtgtttttt tttttatat caattaacgt taaaaattgc atcaactatt 180
taattcatga ggatctttca tattaaaatt taaccttaag attcaaccgc catgtgcttt 240
tataaaggaa acatttttta gagacgtctg agctcacttt tacatggtgg tgctactgc 300
cgtaaattgt tgtgatttt 319

<210> 340

<211> 278

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(278)

<223> n = A,T,C or G

<400> 340

ctaataaaat	gaattaacca	ctcattcatn	natctacca	cccnatccaa	catctccnca	60
tgatgaaacn	ncggctcact	ccttggcgcc	tgccatgatcc	tccaantcac	cacaggacta	120
ttcctagcca	tgactactn	accagacncc	tcaacngcct	tttnatcaat	nggncacatn	180
actcganacn	taaatnatgg	ctgaatcatc	cgctacctnc	acgccaatgg	cagcctcaat	240
attctttatg	ctgcctcttc	ctacacatgc	gggagagg			278

<210> 341

<211> 400

<212> DNA

<213> Homo sapien

<400> 341

ccagcatggg	gctgcagctg	aacctcacct	atgagaggaa	ggacaacacg	acggtgacaa	60
ggcttctcaa	catcaacccc	aacaagacct	cggccagcgg	gagctgcggc	gccacactgg	120
tgactctgga	gctgcacagc	gagggcacca	ccgtcctgct	cttccagttc	gggatgaatg	180
caagttctag	ccggtttttc	ctacaaggaa	ttcagttgaa	tacaattctt	cctgacgccca	240
gagaccctgc	ctttaaagct	gccaacggct	ccctgcgagc	gctgcaggcc	acagtcggca	300
attcctacaa	gtgcaacgcg	gaggagcacg	tccgtgtcac	gaaggcggtt	tcagtcaata	360
tattcaaagt	gtgggtccag	gctttcaagg	tggaaggtgg			400

<210> 342

<211> 536

<212> DNA

<213> Homo sapien

<400> 342

aaagaacaat	gggaaaaaca	agtcctgtgt	ctcacagatg	ctgtcgatga	cattacttcc	60
attgatgact	tcttggctgt	ctcagagaat	cacatttttg	aagatgtgaa	caaatgtgtc	120
attgctctcc	aagagaagga	tgtggatggc	ctggaccgca	cagctggtgc	aattcgaggc	180
cgggcagccc	gggtcattca	cgtagtcacc	tcagagatgg	acaactatga	gccaggagtc	240
tacacagaga	aggttctgga	agccactaag	ctgctctcca	acacagtcac	gccacgtttt	300
actgagcaag	tagaagcagc	cgtggaagcc	ctcagctcgg	accctgccca	gcccattggat	360
gagaatgagt	ttatcgatgc	ttcccgctg	gtatatgatg	gcacccggga	catcaggaaa	420
gcagtgtctga	tgataaggac	ccctgaggag	ttggatgact	ctgactttga	gacagaagat	480
tttgatgtca	gaagcaggac	gagcgtccag	acagaagacg	atcagctgat	agctgg	536

<210> 343

<211> 646

<212> DNA

<213> Homo sapien

<400> 343

aaaacttcta	ttcatcaaaa	gacataaaga	aaacagtcaa	gccacagact	aggtgtaata	60
tctcaatata	tatatccgac	aagagaattg	catctagaat	gtataaagaa	tttctatgac	120
ccaattatag	ctatcaggga	tatacaaat	aaaaccaaaa	tgaaacatca	ctacacaccg	180
attggaatgg	ttaaaaagga	aaaatactga	caacaccaat	atttgtaaag	acaggaggta	240
ccagaaactct	cattcattat	attcataaat	tgacaaatat	aaaaactgct	atagtagggc	300
agtcttccct	agaaagggat	tgtgggcatg	acagagaaca	atattaatct	gtccattata	360
ttccttaact	gtaaaatgga	gaccatatgt	tccaccagct	tcacttggtg	attatgatac	420
atggctatta	agagactcaa	atgactccat	ttcatcaact	aatatgccct	gtcaattcta	480
cttctaaagt	atcccatgtt	ctatccaatg	tcataccact	atcataattt	aagtgttcat	540
aactctctat	aatatttcaa	taatctaact	ggtctcaatg	cctgtagtag	aaattgcaga	600
ttgggctccc	caatttctgt	tccctaggaa	ggctgagaaa	gctttt		646

<210> 344
 <211> 383
 <212> DNA
 <213> Homo sapien

<400> 344
 cctgcacccc agtataaggg cctccccagc tgagtaagaa gctgcttccc ctccctctcat 60
 aggccaagcc tattgtgtga aaccatctca tggctcttggg gacgtagacc atttttgaaa 120
 ccgtctcatg gtcttggtga cgtagaccgt ttgcttcttt aactccagcc gcggaatgac 180
 attagtggaa cggggctagg gaactgctgg aagttcagga tgccaccacc ttgaacacct 240
 aggccaggga tccccaccat gtcccggggt tctttcttcg agagtataga accgttcatt 300
 cttgctttgt gtcccattcc atctcttgaa aaaatgtagt ctttgaatgt gtgaaaatct 360
 agggacattc aatctagtct ttt 383

<210> 345
 <211> 263
 <212> DNA
 <213> Homo sapien

<400> 345
 cctccccttc ccttttctg gtgggaggag ctctgtgtct ccttggccgc ttactggaag 60
 ggcttttttc agagctgcag ggacaggggt agcagctgaa gggctaggag ggaagccggc 120
 cccgctctg cagaagctgc atttcagctg aatctgtgtt tcagcctcag ttggttgac 180
 cgttagcccc tctcctccc gatggtcatg tttttgtcac attagagaat aaacagccac 240
 acacacattt ttttttttcc ttt 263

<210> 346
 <211> 132
 <212> DNA
 <213> Homo sapien

<400> 346
 aaatccaaat acaaaagcat agtctctgca agattttgtt ctttgaattt cttgatattg 60
 taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
 agcatatgaa tc 132

<210> 347
 <211> 564
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(564)
 <223> n = A,T,C or G

<400> 347
 cctgggtatc cagggaggct ctgcagccct gctgaagggc cctaactaga gttctagagt 60
 ttctgattct gtttctcagt agtcctttta gaggcttgct ataacttggtc tgcttcaagg 120
 aggtcgacct tctaattgat gaagaatggg atgcatttga tctcaagacc aaagacagat 180
 gtcagtgggc tgctctggcc ctgggtgtgca cggctgtggc agctgttgat gccagtgtcc 240
 tctaactcat gctgtccttg tgattaaaca cctctatctc ccttgggaat aagcacatac 300
 aggcttaagc tctaagatag atagggtgtt gtcccttttac catcgagcta cttcccataa 360
 taaccacttt gcatccaaca ctcttcaccc acctcccata cgcaagggga tgtggatact 420
 tggcccaaag taactggtgg taggaatctt agaaacaaga ccacttatac tgtctgtctg 480

aggnagaaga taacagcagc atctcgacca gcctctgcct taaaggaaat ctttattaat 540
 cacgtatggg tcacaagata attc 564

<210> 348

<211> 321

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(321)

<223> n = A,T,C or G

<400> 348

gcncatgaac anggagcaac ganaagagat gtcgggctaa gggcccggga cgggcggcac 60
 ccctcctgcn acggaacacn ttcgggttnt ggttttgatt ngttcacctc tgtttatatg 120
 canctatttg ntectctcc cccaccccag nccccactt catgcttntc ttccgcnctc 180
 agccnccctg ccctgtcctc gcggtgagtc antgaccacn gnttcccctg cangagccgc 240
 cgggcgtgag acnngaccc tcnntgcata caccaggccg ggcccnngct ggctccccc 300
 gnggcctgt gaaanagctg g 321

<210> 349

<211> 255

<212> DNA

<213> Homo sapien

<400> 349

ccatgacagt gaaggggctg ttaggaatat caacaccacc gaagcgcaca tagatcacat. 60
 atgtgcccgg cttggcagct gtgtagaaga tgtcataggt tccatcttca ttctcaatga 120
 catcgccctc ggcctcagtg ccactctggg tcagaaccgt gcaggtaact ttacccttcc 180
 cggcagttct ggcatacaacc acaaagccta cttcttcgcc agttttcaca gtggaggcga 240
 ttccaggacc cgtag 255

<210> 350

<211> 496

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(496)

<223> n = A,T,C or G

<400> 350

gggcttattn gtcacaaaa tcattcnctt ttggaactat ggccaattga agctacacac 60
 tgaatttatt aatacagcat taagtttctt tgtgtnaaaa aatctttgtn cncagtaata 120
 aaaaaagata aggcaagatg cattaaacat gaaaccttct ggctcttttc ctctgcgttt 180
 ttacagagcc actgatgact atctgcaaca aaagagttaa gtttctgatt ttccgtatca 240
 agcatcttat gcctttgctg tggtaagaat tctggccaag caccctgaag gacagatgct 300
 ggtgatggnc tttggcactt atgctggcaa actgagcttc tttcccttga gtacttttgn 360
 aatgtacaag tagaagaagt cacaagtata ggatggctct gactacgccg gccaccacag 420
 caatgaggtc aaagaagccc tcaaagnaga agcgnccaga tccagttgac aagatacaaa 480
 gcacgataga ggcca 496

<210> 351

<211> 109
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(109)
 <223> n = A,T,C or G

<400> 351
 ccatagtgaa gcctgggaat gagtgttact gcagcatctg ggctgccanc cacaggggaag 60
 ggccaagccc catgtagccc cagtcactct gccagcccc gctcctctgg 109

<210> 352
 <211> 384
 <212> DNA
 <213> Homo sapien

<400> 352
 ccttcgagag tgacctggct gccaccagg accgtgtgga gcagattgcc gccatcgca 60
 aggagctcaa tgagctggac tattratgact caccagctgt caacgcccgt tgccaaaaga 120
 tctgtgacca gtgggacaat ctggggggccc taactcagaa gcgaaggga gctctggagc 180
 ggaccgagaa actgctggag accattgacc agctgtactt ggagtatgcc aagcgggctg 240
 cacccttcaa caactggatg gagggggcca tggaggacct gcaggacacc ttcattgtgc 300
 acaccattga ggagatccag ggactgacca cagcccatga gcagttcaag gccaccctcc 360
 ctgatgccga caaggagcgc ctgg 384

<210> 353
 <211> 345
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(345)
 <223> n = A,T,C or G

<400> 353
 ccttggtcag gatgaagtng gctgacacac cttagcttgg ntttgcttat tcaaaagana 60
 aaataactac acatggaaat gaaactagct gaagcctttt cttgttttan caactgaaaa 120
 ttgnacttgg nactttttgt gcttgaggag gccattttc tgccctggcag ggggcaggta 180
 tgtgccctcc cgctgactcc tgctgtgtcc tgaggtgcat ttctgttgn ncacacaang 240
 gccangntcc atttccctc ctttttcacc agngccacan cctnntctgg aaaaangacc 300
 agnggtcccg gaggaaccca tttngtctt gcttggacag canag 345

<210> 354
 <211> 712
 <212> DNA
 <213> Homo sapien

<400> 354
 ccatctacaa tagcatcaat ggtgccatca cccagttctc ttgcaacatc tcccacctca 60
 gcagcctgat cgctcagcta gaagagaagc agcagcagcc caccagggag ctccctgcagg 120
 acattgggga cacattgagc agggctgaaa gaatcaggat tcctgaacct tggatcacac 180
 ctccagattt gcaagagaaa atccacattt ttgccccaaa atgtctattt ttgacggaga 240

gtctaaagca	gttcacagaa	aaaatgcagt	cagatatgga	gaaaatccaa	gaattaagag	300
aggctcagtt	atactcagtg	gacgtgactc	tggacccaga	cacggcctac	cccagcctga	360
tcctctctga	taatctgcgg	caagtgcggg	acagttacct	ccaacaggac	ctgcctgaca	420
accccgagag	gttcaatctg	tttccctgtg	tcttgggctc	tccatgcttc	atcgccggga	480
gacattattg	ggaggtagag	gtgggagata	aagccaagtg	gaccataggt	gtctgtgaag	540
actcagtgtg	cagaaaaggt	ggagtaacct	cagcccccca	gaatggattc	tgggcagtgt	600
ctttgtggtg	tgggaaagaa	tattgggctc	ttacctccca	atgactgccc	taccctgcg	660
gaccccgctc	cagcgggtgg	gggattttct	tggactatga	tgctggggga	gg	712

<210> 355

<211> 385

<212> DNA

<213> Homo sapien

<400> 355

cctcatagcc	gcttagcaca	gttacagaat	gtctgaaggg	gacagtgtgg	gagaatccgt	60
ccatgggaaa	ccttcgggtg	tgtacagatt	tttcacaaga	cttggacaga	tttatcagtc	120
ctggctagac	aagtccacac	cctacacggc	tgtgcgatgg	gtcgtgacac	tgggcctgag	180
ctttgtctac	atgattcgag	tttacctgct	gcagggttgg	tacattgtga	cctatgcctt	240
ggggatctac	catctaaatc	ttttcatagc	tttcttctct	cccaaagtgg	atccttcctt	300
aatggaagac	tcagatgacg	gtccttcgct	acccacccaa	cagaacgagg	aattccgccc	360
cttcattcga	aggctcccag	agttt				385

<210> 356

<211> 347

<212> DNA

<213> Homo sapien

<400> 356

aaatgagata	aagaaagtct	ccttttgttt	ttagatggaa	aagaaagcac	aagttttttc	60
tacctgtgaa	tgaactttgg	tgacctatat	gtgccattca	tgcagcattt	ttgttcatat	120
tggcttagaa	ttcagtgcat	gaatatcatt	acattcttat	atctaacatt	cctagttagc	180
tttgattcaa	aatatacaaa	atctgataca	tgaatacttt	gctagattaa	tgacttgatc	240
atctttggaa	tgagtaggca	agacgatttt	tacctattat	ttctatgttg	tgggtaatgt	300
taaaactaaa	tacagatgat	aataattgct	atttcacagt	gatgttt		347

<210> 357

<211> 313

<212> DNA

<213> Homo sapien

<400> 357

aaagtaatca	acctctctgt	ccttccatta	gtctggatcg	tctaaagatt	gttttatttt	60
tagaggctca	tccggtcaga	tgtttagtgat	gtgaaatttc	aggccaggcg	tgacgtcagc	120
gtggcatttg	aaacagctcc	atgttgccct	tagtgctgtc	tgaccgaagc	ctgtctgtcc	180
tcagatataa	agatgaagcg	cagctgtata	aagaagagca	cctgaggaat	cggcagcacc	240
ctractgcta	cgttcagtac	atgatcgcca	tcatcaacaa	ctgccagacc	ttcaaggaat	300
ccatagtcag	ttt					313

<210> 358

<211> 403

<212> DNA

<213> Homo sapien

<400> 358

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aaaaagaagg acttaggggtg tcgtttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacggttgaa ttgatgatgc agtttttcata ttcgagatg ttcgctcgtg      120
cagtactgtt gggttaaata caatttatgt ggatttttgca tgaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaatactga ctccagtgtct      240
gccttttaaa ataaatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt                               403

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<210> 359

<211> 411

<212> DNA

<213> Homo sapien

<400> 359

```

aaataaatac ttagaacacg acttggtctc tacaagcatc tggactctag gtctcagtac      60
tggagtgtct caccatggg cccacgcag ggacgccacg gttccctccc acccctgat      120
caagacacgg aatcggctgc cgatgggttg atcgcaatgc gcccttttc tagagccttc      180
cccgccatc tacaggcagg atgcggctgg gaaaaagaca actggaattt ctccaaggtt      240
gatgggtccg acggttgagg attctacgtg gttctcttgg ttcccttggt gtggtgtgtg      300
gtggaggagg ccgcgccct tagatcacct tcttgagctc gtcgtacagg accagcacga      360
aggcgccccc catgccccgc aggacgttgg accacgcacc cttgaagaag g                               411

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<210> 360

<211> 378

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(378)

<223> n = A,T,C or G

<400> 360

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cctcttcagg ggcccagacc agggacaggg ccttggtttc cttctccctg gcttctgcct      60
cagctctgtc cctctcatcc gcgtatttgg aagagatgtt tttctcctcg gctaacaact      120
gatcaaattt cctctgcttc tttccagggt tggacacgag ttgccgctgg ttgtccaaat
180caacaaccag gtcgtccagc tcctgctgaa gcctgttctt ggtcttttcc agtttatcat
240
aagcggccgc cttctcctcg tactgctggg tgaggntctc gatctccttc tggaaacctt      300
tcttcccctc ttccagagct tccacgngc tggcaaagtc ctgcagcttc ttcttcgagt      360
cggagagctg gatgttga                               378

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<210> 361

<211> 372

<212> DNA

<213> Homo sapien

<400> 361

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aaatactggg ggccattaag agtggatgta gctaagagct tagctaacat tgccttttca      60
ctctattttt ctccagatatt gtaagcattc tgtttttcaa tattgtagtt aatttttttg      120
ctttcaacag cagccctagt aatggtggag ttgttaatta atgtgtatat tgtactgaat      180
ttctgtcagt taaggggttc actgcttttg tggaaattgg tggaaattgc tagcaggttc      240
cacgatgttt atttttttct ccatgttgta tatcattacc atttcacata cgcgttttcta      300
tttttcttcc tctcctcctg atctccttaa aaatgaatct agagttggtg gctttttccc      360
cctcctcttt gg                               372

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<210> 362
 <211> 544
 <212> DNA
 <213> Homo sapien

<400> 362
 cctgagtcac ctagcatagg gttgcagcaa gccctggatt cagagtgtta aacagaggct 60
 tgccctcttc aggacaacag ttccaattcc aaggagccta cctgagggtcc ctactctcac 120
 tggggtcccc aggatgaaaa cgacaatgtg cctttttatt attattttatt tgggtggctct 180
 gtgttattta agagatcaaa tgtataacca cctagctctt ttcacctgac ttagtaataa 240
 ctcatactaa ctggtttgga tgccctgggtt gtgacttcta ctgaccgcta gataaacgtg 300
 tgccctgtccc ccagggtgggtg ggaataattt acaatctgtc caaccagaaa agaattgtgtg 360
 tgtttgagca gcattgacac atatctactt tgataagaga ctccctgatt ctctagggtcg 420
 gttcgtgggt atccccattgt ggaaattcat cttgaatccc attgtccctat agtccttagca 480
 ataagagaaa tttcctcaag tttccatgtg cggttctcct agctgcagca atactttgac 540
 attt 544

<210> 363
 <211> 328
 <212> DNA
 <213> Homo sapien

<400> 363
 aaactgggtta tgacaaaagc ctttagttgt gtttcttgaa ctataaagaa aacaaatttt 60
 ggagctcttt aagtatatac agcttaaaat ataattttta gcatttggca ccatatgtat 120
 gccattarat ttgattttgc attactgttt cacaatgaag ctttctttta ggctttgatt 180
 tttatgatta tgaaagaaat aaggcacaaac cacagttttt ctttcttaaa tttcatcact 240
 gttgatgtgg ttcttttgtg ttaaaaaaaaa aaagtgcac tatcaaaaact aaaaaattat 300
 agagtaatat tgccgttctg ctgatttt 328

<210> 364
 <211> 569
 <212> DNA
 <213> Homo sapien

<400> 364
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 tatctcacta ctttagtttag ttgtctcctt tgggcctggg cacagtctct gccctgatct 120
 ggaacagact cccttttcta aaactgaact tgaccacatc aaaagtttgt aaaacaatct 180
 ccatggtaat taaacttgca ttcaacacca tatggtaaca gaagatggca aaggataaga 240
 ttcagatctt agatctttcc aagtagggca tgttagatga tagaaggatt agttgcaagc 300
 tggatctgag ctccaggcttg ggcataaagg aaactgtctc ccatgtgggt tggaagagtt 360
 aggggctccc tgagctctat tgtgaactat acgggtttca tccaaggaat ggtatgatgt 420
 gggcataaaa ccattcttca gacaactgaa gatgggtccc ttctgtagcc agaaacacta 480
 gctgtcctgc attgtccatt tccttttagcc ccaggcgggtc ctgtgtgtac agggaggtct 540
 cctgtaaggg aatggtttcc ttggcttgg 569

<210> 365
 <211> 151
 <212> DNA
 <213> Homo sapien

<400> 365
 aaaaaaaaa atcctttttat tatggaattt gtcaaacaca cacacaagca taacaaaccc 60

ctaggtaccc atctccaagt ttgaccacct attataattt catcttcagt gttttattat 120
ccacttcctc tctctctatc tttagtattt t 151

<210> 366

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 366

agtataaaga tatattccat aaaagagttt ggcagtcaaa ganaagcatc gcacttccga 60
aaaacacaag cattcttctc ctagtctaca gagaattgng taaaaaaaaa aaaaaatcat 120
catcaacagc cnccantnta cnccacacta gaatgtacac tccggcaagt aaattaaggn 180
tgcagtcctat ccctgaacga tganaagngg tctgagctat ggcacagngt tanaaagtag 240
cccagctana caaatgcccc agctatcccc aggggagtta ttcagtactt aanacttcat 300
ttccaananc agccccggaa aagccctgac aggaaggggg gaccagngat caccgatntc 360
ccattagggg cggnacacaa aaacaaaatg cctggagctt ntgagcagct gcagcctggg 420
gttggtggcta ggcncngggn gnggttgcaa aaaaacggct gtntccgggg agaggcaaat 480
ggcaggccag ccagccctgg gtacatgg 508

<210> 367

<211> 382

<212> DNA

<213> Homo sapien

<400> 367

cctgagcggc tagtctttaa gatgcgcttc tategtttgc tgcaaatccg agcagaagcc 60
ctcctggcgg caggcagcca tgtgatcatt ctgggtgacn tgaatacagc ccaccgcccc 120
attgaccact gggatgcagt caacctggaa tgctttgaag aggacccagg gcgcaagtgg 180
atggacagct tgctcagtaa cttggggtgc cagtctgcct ctcatgtagg gcccttcac 240
gatagctacc gctgcttcca accaaagcag gagggggcct tcacctgctg gtcagcagtc 300
actgycgccc gccatctcaa ctatggctcc cggcttgact atgtgctggg ggacaggacc 360
ctggtcatag acacctttca gg 382

<210> 368

<211> 174

<212> DNA

<213> Homo sapien

<400> 368

ccttctccct ctttgacaag gatggagatg gcactatcac caccaaggag ttgggggacag 60
tgatgagatc cctgggacag aacccactg aagcagagct gcaggatatg atcaatgagg 120
tggatgcaga tgggaacggg accattgact tcccggagtt cctgaccatg atgg 174

<210> 369

<211> 216

<212> DNA

<213> Homo sapien

<400> 369

aaatctcatg ggttctatta aaaaaatata tatatagggc cccaatccat tgccatcaaa 60

ttgcccttgg	actttttccaa	ggtatattat	ggggttttat	gcaaaattcc	aagctaccat	120
gtaacttttt	taaaccattt	aacaaggagg	gggaactgtt	tcctaccttc	tttacatgtt	180
gtgcattgtt	gtggtccaga	aatgccaaac	cttttt			216

<210> 370

<211> 344

<212> DNA

<213> Homo sapien

<400> 370

ccttggtcag	gatgaagttg	gctgacacag	cttagcttgg	ttttgcttat	tcaaaagaga	60
aaataactac	acatggaaat	gaaactagct	gaagcctttt	cttgtttttag	caactgaaaa	120
ttgtacttgg	tcacttttgt	gcttgaggag	gcccattttc	tgcctggcag	ggggcaggtc	180
tgtgccctcc	cgctgactcc	tgctgtgtcc	tgaggtgcat	ttcctgttgt	acacacaagg	240
gccaggctcc	attctccttc	cctttccacc	agtgccacag	cctcgtctgg	aaaaaggacc	300
aggggtcccg	gaggaaccca	tttgtgctct	gcttggacag	cagg		344

<210> 371

<211> 741

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(741)

<223> n = A,T,C or G

<400> 371

aaattacata	tctaatttgt	tgatttggtt	aatgcccatt	tcttcattcta	agtgetaagt	60
gctaagtgtg	gcagtttggt	ccttgctaca	ctccaaggca	caaaggagtt	caaggaatgt	120
gcaatggaaa	tcagtttagat	gaatgtgtta	ggaaccttcc	ctttaataaa	gctggatccc	180
acactagccc	ctacaccctc	tcatcaccaa	atattcctgc	ttcctctcac	ctgcacttgc	240
tgttctctcc	tctgccacac	aaatctacct	ctcaagccta	gggtccacct	gcttcattgac	300
aactttccag	actattccag	aacctttaac	catctctgac	ctctcatcag	atctatgttg	360
tacataacac	caattaatga	gatcattact	gctttatgct	ctaattgctt	cctgtattca	420
aaatcttctc	tccaaccaca	taatgactcc	ctaaacttct	cttgatattt	ccaatgcctt	480
gtacaagcac	agaactgggt	aatcaataaa	tactcactgg	ttatttgagg	aaaaaatgtt	540
gccaaagcacc	atctttatca	gaaaataaat	caattcttct	aaacttggag	aaatcaccct	600
attccttagta	tgtgatctta	attagaacaa	ttcagattga	gaangngaca	gcattgctggc	660
agtcctcaga	gccctcgctt	gctctcggn	cctccctgce	tgggctccca	ctttggtggc	720
atttgaggag	cccttcagcc	t				741

<210> 372

<211> 218

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(218)

<223> n = A,T,C or G

<400> 372

ccgccagtgt	gctggaattc	gcccttggcc	gcccgggcag	gtaccacaac	agcaggnctg	60
------------	------------	------------	------------	------------	------------	----

```

agtgagaaat ctaccacctt ctacagtagc cccagatcac cggacacaac actctcacct 120
gccagcacga caagctcagg cgtcagtga gaatccacca cctcccacag ccgaccaggc 180
tcaacgcaca caacagcatt ccctggcagt accttggn 218

```

<210> 373

<211> 168

<212> DNA

<213> Homo sapien

<400> 373

```

actgctaggg aatgctgttg tgtgcattga gcctggctcg ctgtgggagg tgggtggattc 60
ttcactgacg cctgagcttg tcgtgctggc aggtgagagt gttgtgtccg gtgatctggg 120
gctactgtag aaggtggtag atttctcact caggcctgct gttgtggt 168

```

<210> 374

<211> 154

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(154)

<223> n = A,T,C or G

<400> 374

```

tgagaaatct accaccttct acagngagcc ccanatcacc ggacacaaca ctctcacctg 60
ccagcacgac aagctcaggc gtcagtgaag aatccaccac ctcccacagc cgaccaggct 120
caacgcacac aacagcattc cctggcagta cctc 154

```

<210> 375

<211> 275

<212> DNA

<213> Homo sapien

<400> 375

```

actgccaggg gacagtgctg tgtcagttga acctgggctg ctgtgggaag ttgttgattc 60
ctgactgggg cctgaggttg tgggtgctggc aggtaacagt gttgtatccg ttgagcctgg 120
gctgctgttg gaagttgtag aatgccgact gaggcctggc gtggtggtgc tgtcagggaa 180
tgctgttgtg tgcgttgagc ctggtcggct gtgggaggtg gtggattcct cactgacgcc 240
tgagcttgtc gtgctggcag gtgagagtgt tgtgg 275

```

<210> 376

<211> 191

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(191)

<223> n = A,T,C or G

<400> 376

```

actgccaggg gacagtgctg tgtcagttga acctgagctg ctgtgggaag ttgttgattc 60
ctgactggag cctgaggttg tgggtgctggc aggtaacagt gttgtatccg ttgagcctgg 120
gctgctgttg gaagttgtag aatgccgact gaggcctgcc gtggtggtgc tgnataggaa 180

```

tgctgctagc g

191

<210> 377

<211> 476

<212> DNA

<213> Homo sapien

<400> 377

ccgccagtgt	gctggaattc	gcccttggcc	gcccgggcag	gtacatttcc	ttgtagactc	60
tgtaatttc	ctgcagctcc	tggttggttc	tgagcagat	gatctcaatg	agagagtcct	120
cgtcggttc	cagccccttc	atggaagctt	ttagctcaga	agcgtcatac	tgagcaggtg	180
tcttcaatag	gcccataatc	accgtctcca	ggtggccaga	taaggctgac	ttcagtgtctg	240
atgcaagttc	cttttttggtc	cttctctggt	aggcgaaggc	aatatcctgt	ctctgtgcat	300
tgctgcggtt	ggtcaaaatg	ttgacaatgg	tgacctcatc	cacacctttg	gtcttgatgg	360
ctgtttcaat	gttcaaagca	tcccgctcag	catcaaagtt	agtataggct	ttgacagacc	420
catatgcact	tgggggtgta	gagtgatcac	cctccaagcc	gagcttgcac	aggatt	476

<210> 378

<211> 455

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(455)

<223> n = A,T,C or G

<400> 378

agtgtgctgg	aattcgccct	tggccgccc	ggcaggtaca	catcccatct	tcaaatttaa	60
aatcatattg	tcagttgtcc	aaagcagctt	gaatttaaa	tttgtgctat	aaaattgtgc	120
aaatatgtta	aggattgaga	cccaccaatg	cactactgta	ataattcgct	tcctaaattt	180
cttccacctc	cagataatag	acaacaagtc	tgagaaacta	aggctaacca	aacttagata	240
taaatcctac	caataaaaatt	tttcagtttt	aagttttaca	gtttgattta	aaaacaaaac	300
agaaacaaat	ttcaaaataa	atcacatctt	ctcttaaaac	ttggcaaacc	cttccctaac	360
tgtccaagtn	tgagcataca	ctgccactgg	ctttagatac	tccaatttaa	tgcactactc	420
tttactggtt	ctgaatgaag	tatggtgaaa	caagc			455

<210> 379

<211> 297

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(297)

<223> n = A,T,C or G

<400> 379

agctcggtac	cctagnacgg	ccgccagtgt	gctggaattc	gcccttagcg	gcggcccggg	60
caggtacaaa	gaatccttag	acgccatact	gagttttaag	ttccttaatt	cctaatttaa	120
ggcttctagt	gaagcctcct	cacagtaggc	ttcactaggc	ccacagtgcc	cctagacctc	180
tgacaatccc	accctagaca	gactttattg	caaaatgcgc	ctgaagaggc	agatgattcc	240
caagagaact	caccaaatac	agacaaatgt	cctagatctc	tagtgtggn	gaactat	297

<210> 380

<211> 144
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(144)
<223> n = A,T,C or G

<400> 380
actttgctga aaattctttt tcccagggtc tataaaacat taatttgttt ttatatTTTA 60
ctattttttt gngttttttt gtttttaaat caataagtaa tctaggacta gcattatggt 120
tgctagacct ggcatttgct cggc 144

<210> 381
<211> 424
<212> DNA
<213> Homo sapien

<400> 381
actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg 60
aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tgattcttta aatgtcttgt tcccagatt tcaggaaact ttttttcttt taagctatcc 240
acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
ttctccctat gtggctgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
aaaa 424

<210> 382
<211> 408
<212> DNA
<213> Homo sapien

<400> 382
actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg 60
aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tgattcttta aatgtcttgt tcccagatt tcaggaaact ttttttcttt taagctatcc 240
acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
ttctccctat gtggctgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtatgac 408

<210> 383
<211> 455
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(455)
<223> n = A,T,C or G

<400> 383
actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg 60

```

aactaactgn cnncttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaatTT 120
catggggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tganncttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
acagcttata gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
ttctccctat gtggtcgctc cagacttggn aaactattca tgaatattta tattgtatgg 360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
aaaacattgg ttatattacc aagactttga ctaga 455

```

<210> 384

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(376)

<223> n = A,T,C or G

<400> 384

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actcttgaat acaaggttct gatatcactg cactgtctga gaatttccaa aactttaatg 60
aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaatTT 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt ttaagctatc 240
cacagcttac agcaatttga taaaatatac ttttgngaac aaaaattgag acatttacat 300
tttctcccta tgtgggcgct ccagacttgg gaaactattc atgaatatTT atattgnatg 360
ggaatatagc attgcc 376

```

<210> 385

<211> 422

<212> DNA

<213> Homo sapien

<400> 385

```

acctgtgggt ttattaccta tgggtttata tcttcaaata cgacattcta gtcaaagtct 60
tggtaatata accaatgttt tcaaagtat tctgtcatat aaagagcaga tttttattga 120
acttgtgcaa taactatatt accatacaat ataaatatTT atgaatagtt tcccaagtct 180
ggagcgacca catagggaga aaatgtaaat gtctcaattt ttgttcacaa aagtatatTT 240
tatcaaattg ctgtaagctg tggatagctt aaaagaaaaa aagtttctctg aaatctggga 300
aacaagacat ttaaagaatc agcaaaattt caaataaaaa attatgaaaa tattatcctc 360
attagttcat ttagtcccat gaaattaatt attttctctg cttgatcttg gtggacagtt 420
tc 422

```

<210> 386

<211> 313

<212> DNA

<213> Homo sapien

<400> 386

```

caagtaggtc tacaagacgc tacttcccct atcatagaag agcttatcac ctttcatgat 60
cacgccctca taatcatttt ctttatctgc ttctagtcc tgtatgccct tttcctaaca 120
ctcacaacaa aactaactaa tactaacatc tcagacgctc aggaaataga aaccgtctga 180
actatcctgc ccgccatcat ctagtctctc atcgccctcc catccctacg catcctttac 240
ataacagacg aggtcaacga tccctccctt accatcaaat caattggcca ccaatggtag 300
tgaacctacg agt 313

```

<210> 387
<211> 236
<212> DNA
<213> Homo sapien

<400> 387
cgccctcata atcattttcc ttatctgctt cctagtcctg tatgcccttt tcctaacact 60
cacaacaaaa ctaactaata ctaacatctc agacgctcag gaaatagaaa ccgtctgaac 120
tatcctgccc gccatcatcc tagtcctcat cgccctccca tccctacgca tcctttacat 180
aacagacgag gtcaacgatc cctcccttac catcaaatca attggccacc aatgggt 236

<210> 388
<211> 195
<212> DNA
<213> Homo sapien

<400> 388
acgccctttt cctaactctc acaacaaaaa taactaatac taacatctca gacgctcagg 60
aaatagaaac cgtctgaact atcctgcccg ccacatcctc agtcctcacc gccctcccat 120
ccctacgcat cctttacata acagacgagg tcaacgatcc ctcccttacc atcaaatcaa 180
ttggccacca atgggt 195

<210> 389
<211> 183
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(183)
<223> n = A,T,C or G

<400> 389
taacactcac aacaaaacta actaatacta nnatctcaga cgctcaggaa atagaaaccn 60
cctgaactat cctgcccgcc atcatcctag tcctcatcgc cctcccatcc ctacncatcc 120
tttacataac agacgaggtc aacgatccct cccttaccat caaatcaatt ggccaccaat 180
ggt 183

<210> 390
<211> 473
<212> DNA
<213> Homo sapien

<400> 390
acaaagcagc aactgcaata ctcaagggtta aaacattaga aaagcatttg tgtgacaggt 60
atattacagt attatcaaaa tattacattt tcagacttac ttagcagata atcatccacc 120
agagcttaaa tctttaaatt atttccatag tcttaaaaaa tatgtaatgt cagaatgcat 180
ataaaaagaa tgtaaaagga aacctaaaat acaaatggaa taatgtaaca aataaatatt 240
tgatttcagt aactgttaat aatcagctca acaccaccat tctctctaaa ctcaatttaa 300
ttcttatagg aataatgaac tgtcaaatgc catggcataa ttatttattt ccaagctatc 360
atcaatgatt agaactaaaa aaaatttggc ataaaaaaat cacaattcag cataaataaa 420
gctatttttta gcttcaacac tagctagcat ctctaagaat tggtgaaata agt 473

<210> 391
<211> 216

<212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(216)
 <223> n = A,T,C or G

<400> 391
 atttgatatt taggtttcct ttacattct ttttatatgc nntctgacat tacatatttt 60
 ttaagactat ggaaataatt taaagattta agctctggtg gatgattatc tgctaagtaa 120
 gtctgaaaat gtaatatttt gataatactg taatatacct gtcacacaaa tgcttttcta 180
 atgttttaac cttgagtatt gcagttgctg ctttgt 216

<210> 392
 <211> 98
 <212> DNA
 <213> Homo sapien

<400> 392
 acttatttca acaattctta gagatgctag ctagtgttga agctaaaaat agctttattt 60
 atgctgaatt gtgatttttt tatgccaaat ttttttaa 98

<210> 393
 <211> 397
 <212> DNA
 <213> Homo sapien

<400> 393
 tgccgatata ctctagatga agttttacat tgttgagcta ttgctgttct cttgggaact 60
 gaactcactt tctcctgag gctttggatt tgacattgca tttgaccttt tatgtagtaa 120
 ttgacatgtg ccagggcaat gatgaatgag aatctacccc cagatccaag catcctgagc 180
 aactcttgat tatccatatt gagtcaaagtg gtaggcattt cctatcacct gtttccattc 240
 aacaagagca ctacattcat ttagctaaac ggattccaaa gactagaatt gcattgaccg 300
 cgactaattt caaaatgctt tttattatta ttatttttta gacagtctca ctttgcgcgc 360
 caggccggag tgcagtgggt gcattctcaga tcagtgt 397

<210> 394
 <211> 373
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(373)
 <223> n = A,T,C or G

<400> 394
 ttacattggt gagctattgc tgttctcttg ggaactgaac tcactttcct cctgaggctt 60
 tggatttgac attgcatttg accttttatg tagtaattga catgtgccag ggcaatgatg 120
 aatgagaatc taccgccaga tccaagcatc ctgagcaact cttgattatc catattgagt 180
 caaatggtag gcatttccta tcacctgttt ccattcaaca agagcactac attcatttag 240
 ctaaacggat tccaaagagt agaattgcat tgaccacgac tantttcaaa atgcttttta 300
 ttattattat tttttagaca gtctcacttt gtcgccagg ccggagtgca gtggtgcgat 360
 ctcatatcag tgt 373

<210> 395
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

<400> 395
 actgatcatt ctatttcccc ctctattgat cccacacctc aaatatctca tcaacaaccg 60
 actaattacc acccaacaat gactaatcaa actaacctca aaacaaatga taaccatata 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctcggaacct tgctcactc atttacacca accacccaat tatctataaa 240
 cctagccatg gccatcccc ttagagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccaact tcttaengca aggcacacct acaccctta tccccatact 360
 agttattatc gaaaccatca gcctactcat tcaaccaata gcctggccg t 411

<210> 396
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 396
 actgatcatt ctatttcccc ctctattgat cccacacctc aaatatctca tcaacaaccg 60
 actaattacc acccaacaat gactaatcaa actaacctca aaacaaatga tagccatata 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctcggaacct tgctcactc atttacacca accacccaac tatctataaa 240
 cctagccatg gccatcccc ttagagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccaact tcttaccaca aggcacacct acaccctta tccccatact 360
 agttattatc gaaaccatca gcctactcat tcaaccaata gcctggccg t 411

<210> 397
 <211> 351
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(351)
 <223> n = A,T,C or G

<400> 397
 ngccgangta caaaaaaaag cacattccta gaaaaaggta ttggcaaata gtaaaaatgg 60
 gaggtcaaaa ncaaaaaaaa aaaaaacaaa acnaaaaaaa gaaaaaacca acaattcttc 120
 aattcagtgt gcaaacatta tataaaaaata gaaatactaa ctctacaggc agtatttcct 180
 gataaattat ttaaatagca tatctacnca atctgagata tctattccaa tggcaatgag 240
 aaaataattt ataaaaataa agcaatggta taccanatga tagaaaaaaa cataactttc 300
 agaaattgta tttaacattt caatgctatt tccttattgn gaatncttct c 351

<210> 398
 <211> 363
 <212> DNA

<213> Homo sapien

<400> 398

acaaaaaaaa	gcacattcct	agaaaaaggt	attggcaaat	agtaaaaatg	ggaggtcaaa	60
agcaaaaaaaaa	aaaaaaaaacaa	aacaaaaaaaa	agaaaaaacc	aacaattctt	caattcagtg	120
tgcaaacatt	atataaaaaat	agaaatacta	actctacagg	cagtatttcc	tgataaatta	180
tttaaatagc	atatctacac	aatctgagat	atctattcca	atggcaatga	gaaaaataatt	240
tataaaaata	aagcaatggt	ataccagatg	atagaaaaaa	acataacttt	cagaaattgt	300
atttaacatt	tcaatgctat	ttccttattg	ggaatacttc	tctgcagagt	ttttatgcta	360
tgt						363

<210> 399

<211> 360

<212> DNA

<213> Homo sapien

<400> 399

actgtttcct	cgtgggttcag	gggtgtgcat	gaaggctctt	aggagagcaa	acacctgttc	60
ctattctgta	tgtccctccc	tcatttcaaa	tgagagtaac	caattgagta	aaataaccaa	120
ataaccattg	ccccaccatg	aacatggggc	ttgggaagac	agtcctacaa	tcttcacatc	180
atatttaggt	ttttaggcca	gccagctctt	tttttccaaa	gctttctttt	gaataccgcg	240
ccgggcgggc	cctaaggggc	aattctgcag	atatccatca	cactggcggc	cgctcgagca	300
tgcattctaga	gggcccatt	cgccctatag	tgagtcgtat	tacaattcac	tggccgtcgt	360

<210> 400

<211> 87

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(87)

<223> n = A,T,C or G

<400> 400

ctgcacatat	cnattacact	ggcggccgct	cgagcatgca	tgnagagggc	ccaattctcc	60
ctatattgag	tggaattaca	atnncnt				87

<210> 401

<211> 328

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(328)

<223> n = A,T,C or G

<400> 401

accaggggac	acaaacactc	tgcctaggaa	aaccagagac	ctttgttcac	ttgtttatct	60
gctgaccttc	cttccactat	tgtcctatga	ccttgccaaa	tccccctctg	cgagaaacac	120
ccaagaatga	tcaataaaaa	ataaaataaa	attaataata	aaaaaaaaaa	agagaggaac	180
ccacaaaaaa	aaaaaaaaag	aaagtntata	aaataaaaata	ttgaagtcct	ttcccattaa	240
aaaaaaaaaa	aagaaaaaag	acggactctt	tcattccagtt	ctgatgtgat	tatctctgga	300
aggcattttc	tcctcctctt	ccctcccc				328

<210> 402
<211> 268
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (268)
<223> n = A,T,C or G

<400> 402
nacataatga caacatcttc actagactga gtgttcaagg atttgagatg attcgctatt 60
catcacaccc cgaagattga gatccactgt atttacacaa agcaaagcca tgtcagcaag 120
ggactgtcaa cctgattctg agaacataaa cattcaaaat ttattttcca gtgttccttt 180
ttggaaacca acaacacatc tttaatacct acacacacac acatctntac ctttaaaaaa 240
aaaaaaaaag tгнаacttca cagatagt 268

<210> 403
<211> 538
<212> DNA
<213> Homo sapien

<400> 403
acagtqatag ctccccctgg gcaatacaat acaagaacag tgggttttgt caaataggaa 60
caaggaaaca gaaccacaga aataaataca ttgggttaaca tcagattagt tcaggttact 120
tttttgtaaa agttaaagta gaggggactt ctgtattatg ctaactcaag tagactggaa 180
tctcctgtgt tctttttttt tttaaattgg ttttaatttt tttaattgg atctatcttc 240
ttccttaaca tttcagttgg agtatgtagc atttagcacc actggctcaa tgcgctcacc 300
taggtgagag tgtgaccaa tcttaaagca ttagtgtat tatcagttac caccatttgg 360
ggctttttatc cttcatgggt tatgatgttc tctgatgac acatttctct gagttttgta 420
attccagcca aagagagacc attcactatt tgatggctgg ctgcatgcag acatttaaag 480
cttttagaga atacactaca ccaggagta tgactactag tatgactatt aggagggg 538

<210> 404
<211> 310
<212> DNA
<213> Homo sapien

<400> 404
tttttttata gatcaattg gcttttattt gtgattcatg agtcagggca gtttccattc 60
tgcaaaatat agtgatagct cctactgggc aatacaacag tagaacagtg ggttttgtaa 120
aatgggaatc caggaacaga agaataaaa taaattgatt taaataaact gattgggttaa 180
tttcagaata cttcatatta cttttttcta agagttaaag cagaaaggac tttcttactg 240
tgctgactca gacagcctgg actctcatgt ttttaggaaa attttgtctg ttctgggac 300
tacctgcttc 310

<210> 405
<211> 559
<212> DNA
<213> Homo sapien

<400> 405
acaaatcaca attattaact cactggtagg gcagtgatga tcaaaccaat tgcattcatc 60
catgctgtaa tgttctctct tggcactaaa ggctgactgc agccggcaaa aaagaatgta 120

```

agtatgaatt tataaaaaaca ttttagatgg ctgacaacgg atcttatttt taaagaatat 180
gtctaattca gaggatcgac aactaatcca tttcaataaa acaatgggga attttttatt 240
gaataaaaat gtaatatgca taaaaactca agaaggcttt ttaaaaaatac ttcttcccca 300
atcattatcc catacttcat gctaattttt aaaagaatct tgaaatcttg aaacaagat 360
gaagagaatc ttgttttaag tgacaagtta acattattcc tatattaaat gtcaaatgc 420
tattaatgag tagaagtagg aacaaacccg gatcttagga tcctgtccag gggtcattcc 480
ataactccta tatcacaaag acaagatctg gaaccagaaa acagtcatca tccaatgtgc 540
atcagccttg cggaacag 559

```

<210> 406

<211> 427

<212> DNA

<213> Homo sapien

<400> 406

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acaacagaat atctcgggaa tggactcaga agtatgccat gtgatgctac cttaaagtca 60
gaataacctg cattatagct ggaataaact ttaaattact gttccttttt tgattttctt 120
atccggctgc tcccctatca gacctcatct tttttaattt tattttttgt ttacctcctt 180
ccattcattc acatgctcat ctgagaagac ttaagtcttt ccagcttttg acaataactg 240
cttttagaaa ctgtaaagta gttacaagag aacagttgcc caagactcag aatttttaaa 300
aaaaaaaaatg gagcatgtgt attatgtggc caatgtcttc actctaactt gggtatgaga 360
ctaaaacctt tcctcactgc tctaactatg tgaagaaatc atctgagggg gagggagatg 420
gatgctc 427

```

<210> 407

<211> 419

<212> DNA

<213> Homo sapien

<400> 407

```

acaatttgta gttgtttcca ggtttggtta ataatcattc cttaacctag aattcagatg 60
atcctggaat taaggcaggc cagaggactg taatgataga attaaattag tgtcactaaa 120
aactgtccca aagtgtctgt tctaatagg aattcattaa cctaaaacaa gatgttacta 180
ttatatcgat agactatgaa tgctatttct agaaaaagtc tagtgccaaa ttgtctttat 240
taaataaaaa caatgtagga gcagcttttc ttctagtttg atgtcattta agaattacta 300
acacagtggc agtggttaa atgaatgctg tctacaaggt agataatata ctggttgata 360
ctcaaacat ttttcatttt gtttaaagta gaagttacat aattctatat ttttaagtct 419

```

<210> 408

<211> 523

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(523)

<223> n = A,T,C or G

<400> 408

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acatttgatg ttatgtgaat gttgagtttt tttcttctaa ttttcacttc agcagtgttt 60
agggctttca gatgccttat tccagtgtga acagaaaaag ttcatttttt atgtgggtta 120
tgctttgatg tgtcacataa agagtgttt gttagaaatg ttggcacaat ttttaacttct 180
tagtggtctg tgacattata tattatatat atatgtatat atatctttat aacattcctg 240
tgtttagtag tgtaaatgtt ctgggcaagt ttttaatttt tgaatgcctt tggatattcc 300
agcaataaag gcatcatgtt ctgcaatagg atttcttact catttaccta ttttaacact 360

```

```

aaaatagacc acaactgagc acaaattcct tttataaatg ttatagaagc agggaagaat    420
aataaacaca tttgtgaatt gtggttcagt ttatttatct ttagggaagg ctgatcattt    480
atcttatagc acataacccc agcctcttat tcattatggn taa                      523

```

<210> 409

<211> 191

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(191)

<223> n = A,T,C or G

<400> 409

```

accccgtagt gatgagcact gactgggttca ctggccacat tttagtctt cataataata    60
ggccacaaaa gggctctgtg gtttgccctc atgtgcactg gcccctcccc acccctaggg    120
ggcactcagt agctgctgag aaggcctgtc cacgangctg ttggaacccc ttcaataaat    180
acttagaagn a                      191

```

<210> 410

<211> 403

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(403)

<223> n = A,T,C or G

<400> 410

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acactggcca gtgtgttttt ggcgattaaa cataatcctg tgaatcagat taattcactt    60
gctgagtgtt catttgcggc atccctctgt tgggtcttgg gggccctcca cgacctctgt    120
gggctccccg tgggtccactc tgcccagagc ctgcttgtaa attctgctga tatccatccc    180
gttgatagcc agagtaatcc cggggagcac tgaactgaga ctgtgtataa ccaactgtttg    240
gagtgttaga gaatgaaggg cggttaaccat catatcctcc tctgaatcca ttggcagggc    300
cccggtatcc attcatcaag cctctagcac cacgggagcc tccacgagac acaccacgac    360
tattgtaata gggctgattg ctacgtggaa atccagtgnt ctg                      403

```

<210> 411

<211> 384

<212> DNA

<213> Homo sapien

<400> 411

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acgtgaaatc ataacaacat gttctcttgt gtttggttc tcttgctcag catgatattt    60
ttacggttca cccatattgc atgtatcagg aatataatcc tttttattat tgagttagtg    120
tctattgtat gtatatacca cagtttattt ctcccttcac cctttgctag attttggggg    180
tttttcacat tgcgctattc aagtataaac ctgctctcaa cattcatgtg caagtctttg    240
agtggacata tatttgccgt ttctcttgag tgaatgcacc ttgttgggtc acgtggctta    300
atttaaaaaa attttaatca ctgtggtgca tatgtagtga ttattagtga ttatctcata    360
attttatttt cttgatgact aatg                      384

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<210> 412

<211> 315

<212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(315)
 <223> n = A,T,C or G

<400> 412
 acaatatttc tcctttgaga agataggata tatgatatttc ccaaaaatca caactttgaa 60
 ggaagactta nttgctgact tcaattatat cctggaactg gcaacttggt cccttccttt 120
 gcttcaaaaa aagtgtgaaga aagagtgata agatcaactt taatcattct tggatcttca 180
 gcaaattcag gatcaatgta gaaaaacact ggcatatcta ctccctcttg gggattaagc 240
 ctttgttctt caaaacagaa gcactgtatt ttattgaaat actgtccacc ttcaaattgga 300
 acaatattgt atgna 315

<210> 413
 <211> 554
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(554)
 <223> n = A,T,C or G

<400> 413
 acaggtttca ctattacaaa tatatgatgt taaactaaca aacrcatgac cttcaaagat 60
 gtcttcgtcc cagcacaca catttgtaat ttgtgtccat ttgtatttc ccttcttcta 120
 taatcttcaa attatatagt tatgcattga gttccctatg catctcacc atctccttta 180
 tctcagcctt ctcatacttt gccattctct tctttctgga aataaccagc acaacaattc 240
 cagcaacaac tgctatcacc acaaccacaa taacagcaat aacaccagct tttagacctt 300
 gcattgagaa ttcagggtgt ttttcatcaa cataataaat taaagtttga ccaggatcca 360
 gatccagttg ttccccattt actgtcaggt gccattttct tagaatgaaa caaggattca 420
 cctttaacat ctttttcaaa ataataagcc acatcagcta tgtccacatc attctgagnt 480
 ttttgagaag aattttgaac cagatcaata gtgataacat tattctcata caaaatactc 540
 gngataaatt ntgg 554

<210> 414
 <211> 267
 <212> DNA
 <213> Homo sapien

<400> 414
 accagaaagg cacacgattt tacaatattt gttggaatta ccttactttt taacctcttc 60
 atagcagttt tggtttgagt atattgatga aagccaaagt ctggtatcta aaacttgggc 120
 caatgtttcc caactggtat atgtcaggct ttcccaatag cttaactgtg accctatacg 180
 gatggctttt tagatagttc tatactgctg tattgtgtta gcacttttct ttgtcattaa 240
 caacacactt taaatgacat ttggtga 267

<210> 415
 <211> 454
 <212> DNA
 <213> Homo sapien

<400> 415

accggaacct	gcagaaacag	tgtgagaaat	taagtcctgg	ttcactgcgc	agtagcaaag	60
atggtcaagg	ccatggaaaa	agcagaaatt	taccaagaaa	gctgataccc	atgtatagtt	120
cccactcatc	tcaaatacat	ctgctatctt	tttaagctaa	gtcctagaca	tatcggggat	180
aacatggggg	ttgattagtg	accacagtta	tcagaagcag	agaaatgtaa	ttccatattt	240
tatttgaaac	ttattccata	ttttaattgg	atattgagtg	attgggttat	caaacaccca	300
caaactttta	ttttgttaa	tttatatggc	tttgaaatag	aagtataagt	tgctaccatt	360
ttttgataac	attgaaagat	agtattttac	catctttaat	catcttgga	aatacaagtc	420
ctgtgaacaa	ccactctttc	acctagcagt	atga			454

<210> 416

<211> 370

<212> DNA

<213> Homo sapien

<400> 416

ccgacacggg	gccagcgccc	tgtgctgtgc	ccgccagcta	caatcccatg	gtgctcatte	60
aaaagaccga	taccgggggtg	tcgctccaga	cctatgatga	cttgtaggcc	aaagactgcc	120
actgcatatg	agcagtcctg	gtccttcac	tgtgcacctg	cgcgaggagc	gcgacctcag	180
ttgtcctgcc	ctgtggaatg	ggctcaaggt	tcctgagaca	cccgattcct	gcccacacag	240
ctgtatttat	ataagctctg	tatttattat	taatttattg	gggtgacctt	cttggggact	300
cgggggctgg	tctgatggaa	ctgtgtattt	atttaaaact	ctgggtgataa	aaataaagct	360
gtctgaactg						370

<210> 417

<211> 463

<212> DNA

<213> Homo sapien

<400> 417

acactttata	tattccaaat	tgatcagata	tatggtttgc	aaattcatct	caatctgtag	60
cttatctttt	cctcttctta	aatcacaagt	ttttaaat	tgaagaagtc	caatatatca	120
gattttgtct	tttatggatg	tgctttcggg	gcaaagtcca	agaacttgtc	acctagccca	180
agatcctgaa	gatttttctc	ctgtggcttt	tttcaaagtt	atctagtttt	atgtatcaca	240
tttaagtccg	ttatacat	tgagttaaat	tttatataag	acgtgagggt	taagtagagg	300
ttcttttttc	tcctcgccat	gggtgtctaa	ttgctctagc	ataatttgtc	agaaaggcta	360
ttcttcctcc	attgaattgc	tttttcactt	tttcaaaatc	agctgagcat	atttatatgg	420
gtttatttct	gggttctctc	atctgttcca	ttgacgtatg	tgt		463

<210> 418

<211> 334

<212> DNA

<213> Homo sapien

<400> 418

ttagcatttg	cttttatttt	tttactttga	tgctttttca	aattggcatg	tctttaaagt	60
atttttcttc	ctgattaaaa	atgtgtgtgt	atgtgtgtgt	gtgtgtgtat	atatatat	120
ttttaaatca	cattaatttt	accaagtga	accaagccat	actgtttttg	agccaattaa	180
gaaaattgcc	atttttaaag	tgtagcattt	cagggtaaag	acccatgaaa	tggcttgatg	240
tattctagac	tactgaaaga	aaaccacttc	aaagattttg	ttgaaagttt	tagtgttgtc	300
tgaaatgcaa	gagggaaggt	gattggtagt	gagt			334

<210> 419

<211> 297

<212> DNA

<213> Homo sapien

<400> 419

acttctttga	ccaaggaata	ccacagacac	cctaccgata	gaacagtggc	tcagatctta	60
cttgctcctg	cttacgaagt	attcccaatc	actggtcac	tgaccctact	tgaacactcc	120
tgaacagtca	tgttttttaa	aatcttcctt	tatatcaagt	cagagagtat	acttctataa	180
atttcaactca	tggatgtag	gaaatctagt	catcttcctt	gtgattgccc	tgtaaagtat	240
ttaaccatag	ctatcatgtg	tttcccaa	cttctctaga	ttaaataatct	tcagtta	297

<210> 420

<211> 418

<212> DNA

<213> Homo sapien

<400> 420

acgagaggaa	ccgcagggtc	agacatttgg	tgtatgtcct	atcaatagga	gctgtatttg	60
ccatcatagg	aggcttcatt	cactgatttc	ccctattctc	aggctacacc	ctagaccaaa	120
cctacgccaa	aatccatttc	gctatcatat	tcctcggcgt	aaatctaact	ttcttccac	180
aacactttct	cggcctatcc	ggaatgcccc	gacgttactc	ggactacccc	gatacataca	240
ccacatgaaa	tatcctatca	tctgtaggct	catttcatttc	tctaacagca	gtaatatata	300
taattttcat	gatttgagaa	gccttcgctt	cgaagcgaaa	agtcctaata	gtagaagaac	360
cctccataaa	cctggagtga	ctatatggat	gccccccacc	ctaccacaca	ttcgaaga	418

<210> 421

<211> 304

<212> DNA

<213> Homo sapien

<400> 421

acgcctggac	ccctgtgact	tgcagcctat	ctttgatgac	atgctccact	ttctaaatcc	60
tgaggagctg	cgggtgattg	aagagattcc	ccaggctgag	gacaaaactag	accggctatt	120
cgaatattat	ggagtcaaga	gccaggaagc	cagccagacc	ctcctggact	ctgtttatag	180
ccatcttcct	gacctgctgt	agaacatagg	gatactgcat	tctggaaatt	actcaattta	240
gtggcagggt	ggttttttaa	ttttcttctg	tttctgattt	ttgttggttg	gggtgtgtgt	300
gtgt						304

<210> 422

<211> 578

<212> DNA

<213> Homo sapien

<400> 422

actgtgcagg	cagattcaca	gggtggtggt	aaagcatcca	caatggctct	ggcagcatca	60
ggatcacact	tgaaggggct	ctcagacaaa	gttgatttca	tgcaactgat	tccttttcca	120
ttcgttttct	tagtactaa	tgctttccaa	tggtcatgag	tgctttta	aatatcaatg	180
gcaaagtcct	tatctttaaa	ttctgcatta	aacgcaaact	cattttctgg	ttttccatca	240
ggaaccttat	acctttctaaa	ccagtccaca	gtagcttcta	agtagccagg	tttcagccgt	300
ttgacatcat	tgatattcatt	ataattggct	gcacaggat	catccacatt	aatggcaatg	360
actttccagt	cgggtttcccc	ttcgtcaatc	atagccaata	tgcttagaac	tttcaattat	420
ttatttcacc	tcttgacat	accttgcttc	caatttcaca	cacatcaatt	gggtcattgt	480
caccacaaca	gccagtatgt	ttatcattgt	gccctgggtc	ttcccaagtc	tgagggatgg	540
caccatagtt	ccagatatat	cttttatacg	ggaacaaa			578

<210> 423

<211> 327

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)... (327)

<223> n = A,T,C or G

<400> 423

acagtatatt tttagaaact cttttttcta ctaaaacaaa cacagtttac tttagagaga	60
ctgcaataga atcaaaattt gaaactgaaa tctttgttta aaaggggttaa gttgaggcaa	120
gaggaaagcc ctttctctct cttataaaaa ggcacaacct cattggggag ctaagctagg	180
tcattgtcat ggtgaagaag agaagcatcg tttttatatt taggaaattt taaaagatga	240
tggaaagcac atttagcttg gtctgaggca ggttctgttg gggcagtgtt aatggaaagg	300
gctcactgnt gntactacta gaaaaat	327

<210> 424

<211> 384

<212> DNA

<213> Homo sapien

<400> 424

acgaaaaata aatctcctta aaaactaaat aaaatgcact gtattcttac agttaatgtt	60
tataactata gtaaaaaatt aatatatata ctattacata aatgttatct cttaggtgtt	120
ccattaagaa gagcaataga ataattgctaa aaataaatgc ctataaatct tcagagata	180
aagacatcca ttcagaaaca aaaattagca cttaattttt tataaaatag accagatgac	240
aaaattttatt ttatttttta acagtgggtt tgacacaaat tatgttattg aaaagcatta	300
ttaatgttta atttatttta aatttttgaa tttgccattt ctacagagaat gatcaggcct	360
taggaaatta atacagtagt agta	384

<210> 425

<211> 255

<212> DNA

<213> Homo sapien

<400> 425

actatcaggc tttgtgctga tttcctgaac aaactgcatt atattatgaa aacaaaagga	60
aaagaagaaa taataaaaaac tatactocca tatttcactt acagtgtttg agttcctgga	120
aggacctata taatggaggc agcattcaaa caagaaatta tgccaatcaa ctgtcaaatt	180
ttcactataa ttttcctaaa aaggcgtttt tcccccaata tctattaatc tcaaagaaac	240
ataagttgtg aatgt	255

<210> 426

<211> 196

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)... (196)

<223> n = A,T,C or G

<400> 426

acatgaantn nccaggccca cacagccaga cagcaacaga accaagacct agggctcttc	60
actcctgtta catcacacca tggcaatgat tttacattct ccaactgatt caaatcatat	120

ggcagctagg gatttggggg ctccatgttt tatttcaatt gcaagttcaa gatttctttt 180
tatctttgtg ggctga 196

<210> 427
<211> 163
<212> DNA
<213> Homo sapien

<400> 427
acagaagatc catggaggca agtgctgtca ggaaggacac tgcctccctc caccctccca 60
aatgtcacca ccaagttcct tcaggtgaga cctcacacaa tgtcaagtgc tttctaggaa 120
atactaagat caggttgaga gattctgctt ggtctagtca atc 163

<210> 428
<211> 315
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(315)
<223> n = A,T,C or G

<400> 428
nactgagtan agatgctggg gaatgtgcaa tatgccttga agaattgcag cagggagata 60
ctatagcacg actgccttgt ctatgcatat atcataaagg ctgcatagat gaatggtttg 120
aagtaaatag atcttgccct gagcacccct cagattaagc gtcagcttcc tgttttatag 180
gttttcttgt cttgacaaga tgcttgaaaa accaagagga tatgaaaatc tgtctctgga 240
gaaacaaaga cgcaggcata ctgagccaga aatctgagtt ttgtgagact tggtaatata 300
gagatggaca atcgt 315

<210> 429
<211> 131
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(131)
<223> n = A,T,C or G

<400> 429
acagttaggn actagaacat ttgttaagcc tcccaaagta gngtgcatgg aagattctag 60
agtgtccagc tcttgacta caaatgtaat aataacagaa taaatacact taccctgatg 120
atattgaggg t 131

<210> 430
<211> 503
<212> DNA
<213> Homo sapien

<400> 430
actgattttt aataaaagaa ataaggttca aagtttagca caacaacaca gcaataagaa 60
gctgacaact tggataaaaa tacaagaaag taacacagag cccagggtac ccattattta 120
ctgtgtgcat acaggaatgc tatacttcag atgtataaat tagagactga ttttaagtta 180

ttaattttaac tactttttgt ccaactgtgct aaactaaatt ttatactaataa gtgctactgc	240
gtaaacactt caaagcaatc ttcatataaa tgctgcaaag aaaaacaaga atacacatca	300
tccaaaacta aggatgtcat tgcagttcac agtttgtata ataaataccc tccctttcaa	360
tcactactaa gatcactaca tcctatctac tcatacagcac aaccttgaag caacttatac	420
ttacaaatat tagcaatgca gccaaacatt tgttttttgc aaagcaacta gtaaaaaatca	480
agaatttttaa ttaagacggt gca	503

<210> 431
 <211> 207
 <212> DNA
 <213> Homo sapien

<400> 431	
acaagtgtgg cctcatcaag ccctgccag ccaactactt tgcgtttaaa atctgcagtg	60
gggccgccaa cgtcgtgggc cctactatgt gctttgaaga ccgcatgac atgagtcctg	120
tgaaaaacaa tgtgggcaga ggcctaaaca tcgccctggt gaatggaacc acgggagctg	180
tgctgggaca gaaggcattt gacatgt	207

<210> 432
 <211> 485
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (485)
 <223> n = A,T,C or G

<400> 432	
aaaaaaagta atggaaaaat gggtgcaggt ttaatcncaa aangaactta attttngtng	60
attttgtttt atctgctaaa acactaatat ctataaatat gaactgacag catcgttcta	120
aatttacttc tgaagagctg tcgagacttc aataaaatat aagcaagtta ctggatcata	180
tttatggact gctgaattaa ctaccgaaa agtatcagtt actttcaaag aacacaaaac	240
aaagtgaacg tggaaaaaag cttcttttgc aaaagtcctt ttattagtcc tatcctctaa	300
aattccaagc cacagagcct tgatattcct ggattctgtt ttaagtaacc ttagttttaa	360
atatgacact tgggatatgc acaatgggaa agggtaggat atgtgaacaa aatttaattt	420
cttttttcca aaggnagnca ttttctttaa atncatccta tccacttttg cccacttccc	480
catgt	485

<210> 433
 <211> 280
 <212> DNA
 <213> Homo sapien

<400> 433	
actgtcacta caatattaca ttctgcaaat gttattctgt tgtatcagat acaaaaatttt	60
agtgaaggtat ctctaaggca catagtagaa aacaaaattg gtttaattact caagttcctt	120
tcactgtgat ttggaaatga tttaatcttt atagaargag aacctttttt ggactagctt	180
ttttattaaa atggctcaat ttgtgttgat aaggattgca ttaatatatta atagtgttg	240
cttttcctct gggcacacca ttttgatcat taaccagagt	280

<210> 434
 <211> 234
 <212> DNA
 <213> Homo sapien

<400> 434

ctttgctgcg	catcaggtgc	tttaagcttc	ggaacaactg	tgcaggattc	tatttttagta	60
ttctggaagc	atcattgagg	aagtagtcca	gtgaagttag	ctctaaaaaa	actctttact	120
ctaacaatta	aaagaaatat	gccaaaggat	ccataaggga	tgaataaatt	attaaactat	180
taagaagttg	ctataaatat	gcagtgttaa	ttcaataatt	cataacggac	tggt	234

<210> 435

<211> 330

<212> DNA

<213> Homo sapien

<400> 435

acctcccgtg	tcaccagttc	ccacagaagc	actgcaaaac	tccacatgtc	tgctgagcgt	60
ctgtttgtgt	cttcaggctt	cttctgcaga	gcttcggggg	ctacccaggc	aggtgcatac	120
atgcgaccag	gacattggaa	agagaacttg	acatcagcca	tgctaattcg	ggcagtcatg	180
tcctcatcaa	tcattacact	acggctattg	agtgcattgc	gtgggatgag	gggctctagt	240
gtgtgtagga	aagccatgcc	ccttgccatg	tccaaagcaa	acttcacagc	ctggctctgg	300
tccacgacga	aattgggtgc	ttcatgtagt				330

<210> 436

<211> 311

<212> DNA

<213> Homo sapien

<400> 436

acaactttac	aatggaattg	tatttcaatg	attattttga	tatcagatta	aaccttccaa	60
aaagttacac	ataattcagg	tctatttttt	ctaccagtaa	gagttctgct	aaattacaaa	120
accccataat	cacagtgttc	agttttttaa	aaattaaaca	cacagtaatc	ctgtcaatgt	180
taatcaaaa	caaaaacttcg	gaatgccgtg	gcattttatgt	gaccaatctg	agtttttagat	240
acaaatacca	gctgtttatc	ccatgaacca	tttttcctag	gctgaggctg	tgaaaaatcg	300
aaagtcggcg	t					311

<210> 437

<211> 355

<212> DNA

<213> Homo sapien

<400> 437

actagtggat	gggggtcagg	gtgtcactcc	aaggccctct	acagaccag	agaagaggaa	60
agtcaaaaaa	gccagatatg	agactgctga	agtgggtgta	agaaatatag	gcaaggtaaa	120
gggaacaaga	tctgggtccc	ctcctacttg	tgtccctcac	tggaacctcag	acaccctacc	180
tctaagactg	gttcttagaa	ggctgaacag	taaggagcat	tccaatagct	tctgaaactc	240
ccaaggctgt	ttcaagtagt	cgaaagccat	ccctggactg	ttcagggtgcc	ttttctatct	300
cccacctgag	ctctctgccc	tttcttttag	cctcacaggt	ttccagaatt	acagt	355

<210> 438

<211> 431

<212> DNA

<213> Homo sapien

<400> 438

acagtaactt	taactttaca	tagagctgag	ataaaaaataa	agctttctta	caaattacat	60
tttttttcca	gtgaattact	tttgagtaa	aaatagctgc	tacataaatc	cctcctgatc	120
tctgaaaagg	agttgcatat	ttccaaaaat	aatattctta	ttttaatcac	acagaagaac	180

gtggagcaca ggaaggaaat ggctgggtgg tcagagagag gtgagctgtc ggagaaacac	240
agttaaacta aaaaataaaa tccattttgt gtataaactg acttaaacgc atgcaaagaa	300
gtggaaaaca tatgccattt gtcaagaaaa atactgcttt atagctttta ctttacaatt	360
aaaggagaaa gcagaggcca gatataagcc cagataataa catttaagtt tctcataaaa	420
ctcccaaattg t	431

<210> 439

<211> 170

<212> DNA

<213> Homo sapien

<400> 439

actgtcataa aaaacagtgg agctctgtat tagaaagccc ctcagaactg ggaaggccag	60
gtaactctag ttacacagaa actgtgacta aagtctatga aactgattac aacagactgt	120
aagaatcaaa gtcaactgac atctatgcta catattatta tatagtttgt	170

<210> 440

<211> 400

<212> DNA

<213> Homo sapien

<400> 440

acgtaaaaag aacatccttc ccatcttcaa ggtcaagatt gaacgctgac tcctgcagga	60
agtcttccag gattcccagg caggaatgat ggctccctgt ccctgtagct ccaggagttc	120
ttgcttcacg cacgcctcac ataccagact gaatgttggc aggaggagtg accagggtcg	180
tcctctgtgt ccctaccacc tacaacaggc cagcaatcta cccgtgtgtg ttgtgtggac	240
agaattaacc atgatgggag gccgagggcg cctggagcta tttgggggct tggagagAAC	300
ctcttaggag agtgtcaggc tctaggccag tctcaccaga ggagggtcagt ctcagtcctt	360
ggagtgggtgg gatggaaacc agacgggact ggcattggtcc	400

<210> 441

<211> 204

<212> DNA

<213> Homo sapien

<400> 441

acctagttac ttcttaagat caggtgtata aaactgtgga gtggagcggg atggtatgga	60
atgacttgga atgtaagctg tcaggagaaa aatgttgtta cacttttgct aagatctggg	120
ggtttcttca tattcctgct gttggaagca gttgaccaga aatgcttgcc agtactgcca	180
aagcactgct gtgaaatgtg aagt	204

<210> 442

<211> 649

<212> DNA

<213> Homo sapien

<400> 442

acatttaatt ttttacaaca ttttctccct agagatatataa tttagatatt cctatcttca	60
aagtaaaaaat caaaatagga aataagcata gaaacagcct attggcagtg gttacacctg	120
catgggtattt atgagtctcc aaactattgg aaattttatt caaccaaggc tctcttaagt	180
cttcattact tgggtgtaac tcgagagaaa actaatttat atcaatttac agtttagtgg	240
tcattgatcag gggaaagtga tactcttcca ctgactacaa gtcattgcag aggcagttta	300
gaacttttcc tttattccta atatacagga caaaccttgc cgacatctca ctacctcaaa	360
aatcaaattt aaatgaagta tccaggagta gcctaaagaa tgagtgtaat ctggatggat	420
tttagtctaa atttatgcct tgctcttcag taaagtatag taactccaga tatatgttcc	480

acagatgcaa taatttctgt tccttggtcg gtgcagaata taatttatac ttcctgaaat	540
caactttgtc tattcatgaa aatagctgct ttttatttgc ctttgtctca ctttgaatat	600
atatgatcca caggttacag acttttccaa taactacatt tcaacttgt	649

<210> 443

<211> 346

<212> DNA

<213> Homo sapien

<400> 443

acgtgggatt gaaatgcaca tacatgtttt tgctaagagc acatacattt cattctcctc	60
actttgttca taacctcagc attgtcagat aacctcagtg agttaactca aagcctttta	120
ttatggaaag aactggcaca gttacatttg ccagtgaggaa catccttaaa aattaataac	180
tgatgggtca cggacagatt tttgacctag ttcccttttc ttttagagca aaaagaactt	240
ttacctcggc atccagccca acccctaaag actgacaata tccttcaagc tcctttgaaa	300
gcaccctaaa cagccatttc cattttaata gttggatgcg gattgt	346

<210> 444

<211> 425

<212> DNA

<213> Homo sapien

<400> 444

accaatttcc ttttacagta aaggggcttt tectgttgct tgttgaaccg gttcccagct	60
gccattacc accaagccca aaagagtaaa ttcgtcctge tgaaggaaca aaagcagaag	120
tgtgctgccg tccacaagca atctcagtga caatgcttcc cataagttca aaaactttcc	180
ttgggtttat ttcatgactg gtagaattat ggcccaactg accataccct ccagctccaa	240
aagtaaacac tccaccttcc ttggtttagag cagcagtatg atcttctcca caacaaatat	300
aaactatttt ctgagatctt aytgacttta gtaaattagg aacataccta tcattttcat	360
cattaagacc tagctgacca aacttggtgc gtcccatcc aaagatagct ccagaaaggg	420
tgagt	425

<210> 445

<211> 210

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(210)

<223> n = A,T,C or G

<400> 445

nactgtccca atataaaaca gtaattattt gacctttgca ctgtttgtct ggtccttttc	60
agtttgattg catataaatg tggaacttga tagatctcta tatttttaat gcacttgtga	120
taactggca gcagggttag acattacttt caaagcttga ggtagaccga gtcagcatgc	180
tagacaggct tctctctcta accaaaactg	210

<210> 446

<211> 326

<212> DNA

<213> Homo sapien

<400> 446

tcgaaagacc cctgtaaaag agcccaacag tgaaaatgta gatatcagca gtggaggagg	60
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cgtgacaggc tggaagagca aatgctgctg agcattctcc tgttccatca gttgccatcc 120
actaccccggt tttctcttct tgctgcaaaa taaaccactc tgcccatttt taactctaaa 180
cagatatttt tgtttctcat cttaactatc caagccacct attttatttg ttctttcatc 240
tgtgactgct tgctgacttt atcataattt tcttcaaaca aaaaaatgta tagaaaaatc 300
atgtctgtga gttcattttt aaatgt 326

```

```

<210> 447
<211> 304
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(304)
<223> n = A,T,C or G

```

```

<400> 447
ncntcnaggt acatgctaga agtctgatgt ngtnngtaac acagaaacat acacagtctt 60
catattcaaa gtcttcacng ggatgtcggt ctgtaatttc ctgctgttgg gtctcttcca 120
gaaacagctt tagcttccctg ctccgaaggc caaacacctt ggctgcttca tacagaagac 180
cttggtgggt gagtcattc tgcccaagtg ggttttcaag caggagagtg cccactgtcc 240
ccattaaaca ctcttggtggc ttgcatcca ggagctgtag gttgatatac tgacaaggaa 300
gagt 304

```

```

<210> 448
<211> 203
<212> DNA
<213> Homo sapien

```

```

<400> 448
acatgaaagc ggcaatgcgg taaaaagcga attcttacct aaggctcagaa ttttttatta 60
agcgcatttt cattagttgg acaacaacc ttataaacc ttatgtcaaa ccatataatg 120
tgaagaatct ccatgggaga gattttttt cacccttcag aattatcttt ttcccctaag 180
accttcatat gaatcttcct tgt 203

```

```

<210> 449
<211> 481
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(481)
<223> n = A,T,C or G

```

```

<400> 449
acttgttcta taatactctg atgtttcctt aaattcctga acaacattct gtttactaaa 60
tttcttttct tcctttattc acaccaaat ccaccctata atagaagcta attatttcag 120
aaagcttttt agtgatcatt tattactttg tgtttactag atattaattc taagatgaat 180
tcctttagaa ttttagaaaa aattattcta gacaacaatc aaagtaaagg atacatccag 240
cattgaaacc ataagccggc aagtctccag gttaaaagg ttgtatcctc cagcaatgcc 300
agactgtgtc agacatctct gcaattcatc agcatctatc tgcccattct gtccagctac 360
agcagcaaag taaccatata gcggatcctg agtttgccg ggaaacgcag gccctccggg 420
agcccctcca tactgcatct tgagttgaag tcttatangt agaagctggt gatccttaga 480
g 481

```

<210> 450
 <211> 296
 <212> DNA
 <213> Homo sapien

<400> 450
 acatgggttta atacaacaac aaaaaaattt aatcaagtga aacgtaataa actgaacaat 60
 aaacactcaa aacattttcc attggaaaca tgtaaagaca atatgagggtt ttgttaccat 120
 cttactgcaa ttttcttatg tgttactagt ctacataccc catgttttct gtaatcatgc 180
 agatgtgaat ggaagtttga atgattaaat aaatgaaaag tccgtttact gcaggggaatc 240
 atttcacaag gcagccaaac cgggttttaga gaacaaaact attcaagaaa ttctcc 296

<210> 451
 <211> 294
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(294)
 <223> n = A,T,C or G

<400> 451
 acatgntcca aggcacgcgn ctgtgaactt cctctgagtg aaggcatccc ctccagcacc 60
 tttcagcctg ctagttagga cgaccgcgcg ccaccctcca ggacctccag ccctgcactg 120
 ctttctctct cttttaaata attcttcatt gagttctaat atgtaaaaaa aaagtttact 180
 gtaaagtgtg caaataanga aatttttttt aaaagtcctc agtaatctta ccagtaacaa 240
 ttgttatggg cacatttgct tttggaagat ttcttttcta tgcattggat aagt 294

<210> 452
 <211> 129
 <212> DNA
 <213> Homo sapien

<400> 452
 acttttagat cacaaatttg cttttaagta acacataata cacttaaggc agatttgcct 60
 tacaggtggc ctacgttctt aaacaccact acactgcttt atataaaaaa caaaaatcac 120
 atagaagag 129

<210> 453
 <211> 151
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(151)
 <223> n = A,T,C or G

<400> 453
 actctcaann tgtatttagg tgccaacaca tttaggatca ttgngnnttc tcagtgaatt 60
 gaccttttta tgagaataaa atgtctatct ctgaaatgct cctatttctg gaaatgttcc 120
 ttatactaaa gtccaacttg tgtggattan t 151

<210> 454
<211> 119
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(119)
<223> n = A,T,C or G

<400> 454
tgctgatgna gcatgctttt taaatccttt aaaaacactc accatataaa cttgcatttg 60
agcttggtgtg ttcttttggt aatgtgtaga gttctccttt ctcgaaattg ccagtgtgt 119

<210> 455
<211> 515
<212> DNA
<213> Homo sapien

<400> 455
accttataaa gttccttttc atccttctct gtcttcaact gacattcaag ttgttctctt 60
tcatgttgag ccttcttgag tttggccttt aaactgtcta attcggtttc tttttcaatt 120
gctttatgtg ttactgacac aatatcttcc tcaagctgat gggctttgga tgtagcatca 180
ctgaacctct tcttaaactc ttcattttcc atttttaagc tttgtgttac ttcagtaaga 240
cccttttggt ctgcttgacg ttgttcacat ctttctttct catggttaag ttctctttcc 300
attctcccaa cttgttctcg aagttgtgct gtttcttttt ccagaacggc aattaacttt 360
aacagttctt ctttttcttt catggttttc tcaattttca actcaagaag gcctgctttt 420
gtggtcacca ctaacatgtc agaatttcct tcatcttcca tagtaagcag ctcttcaact 480
ggagaagaag ctcgaaactg gaaaggtgta cctgc 515

<210> 456
<211> 350
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(350)
<223> n = A,T,C or G

<400> 456
actcccctcc ccaaataga acctcaaaga ctgatccatt tcccctaggg cctgggccag 60
gagtagctca ctgctcactg ctgaggagaa aggcacaaga tataatgtca taagagcagg 120
acagtggctc agcctacaga gttccctata ggggaaaagaa ggcaggaaat aggcgcaggg 180
tctggtcctg tccctgcacc accctgagca gctagtcttg ggaagggatt acaggccctg 240
ggccataggg tgctcgccat tetgctttcc tatectgttt ctctccctgt gctgctccct 300
tttagccagn gctgagaaat gttcancacc tgaggcaaaa ctgccatagt 350

<210> 457
<211> 293
<212> DNA
<213> Homo sapien

<400> 457
gcagggccaa cagtcacagc agccctgacc agagcattcc tggagctcaa gctcctctac 60

```

aaagaggtgg acagagaaga cagcagagac catgggaccc ccctcagccc ctccctgcag 120
attgcatgtc ccctggaagg aggtcctgct cacagcctca cttctaacct tctggaaccc 180
acccaccact gccaaagtca ctattgaatc cagccattc aatgtcgcag aggggaagga 240
ggttcttcta ctgcgccaca acctgcccca gaatcgtatt ggttacagct ggt 293

```

<210> 458

<211> 500

<212> DNA

<213> Homo sapien

<400> 458

```

actagactcc agattaccct ttcttaataa atatctcagg gtaaggaaag aaagaaactg 60
tatagatata tttaaaatag agaatacttt ccaagcaata catgatgcct ttcctaaaag 120
actctaaaag aaaaagattc tgtaactctc ttttagcacc aaattattgt ttatcttgct 180
ggatatttta tatgaacagt gttaatttag atgcactaaa gcaaaggtag gcaaactaca 240
accatgagtc aaacatggcc acacccattc atttgctatt gtctaagctg gttttgact 300
acaactgcag agttgaatag atgcagcaga tcctttacag aaaaagtgtt ctgacctcaa 360
ttctaaagta attgtagtag ggagctggag gactttcttt ccctttatgg taattttttg 420
agctacaaaa agagccttgc agaaatgggt gaagggatta atctttttaa aataaatgct 480
atatattagg aaaataaaaa
500

```

<210> 459

<211> 394

<212> DNA

<213> Homo sapien

<400> 459

```

ggtgaaaaga cttgatTTTT tgaaaggatt gtttatcaaa cacaattcta atctcttctc 60
ttatgtatTT ttgtgcaact ggcgagttg tgltagcagtt gagtaatgct ggtagctgt 120
taaggtggcg tgttgcaagt cagagtgtt ggctgtttcc tgttttctcc cgattgctcc 180
tgtgtaaaaga tgccttgctg tgcagaaaca aatggctgtc cagtttatta aaatgcctga 240
caactgcact tccagtcacc cgggccttgc atataaataa cggagcatac agtgagcaca 300
tctagctgat gataaatata cctttttttc cctcttcccc ctaaaaatgg taaatctgat 360
catatctaca tgtatgaact taacatggaa atg
394

```

<210> 460

<211> 279

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(279)

<223> n = A,T,C or G

<400> 460

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actnccgatt gaagcccca ttctgataat aattacatca caagacgtct tgcactcatg 60
agctgtcccc acattaggct taaaaacaga tgcaattccc ggacgtctaa accaaaccac 120
tttcaccgct acacgaccgg gggatatact cggcfaatgc tctgaaatct gtggagcaaa 180
ccacagtttc atgccatcg tcctagaatt aattccccta aaaatctttg aaatagggcc 240
cgtattttacc ctatagcacc ccctctagag caaaaaaaa
279

```

<210> 461

<211> 278

<212> DNA

<213> Homo sapien

<400> 461

```

tttggacact aggaaaaaac cttgtagaga gagtaaaaaa tttaacaccc atagtaggcc      60
taaaagcagc caccaattaa gaaagcggtc aagctcaaca cccactacct aaaaaatccc      120
aaacatataa ctgaactcct cacacccaat tggaccaatc tatcacccta tagaagaact      180
aatgttagta taaagtaaca tgaaaacatt ctccctccga taagcctgcg tcagattaaa      240
acactggact gacaattaac agccaatatc tacaatca                               278

```

<210> 462

<211> 556

<212> DNA

<213> Homo sapiens

<400> 462

```

aacgtccaag gggggccacat cgatgatggg caggcgggag gtcttggtgg ttttgtattc 60
aatcactgtc ttgccccagg ctccgggtgtg actcgtgcag ccacgcacag tgacgctgta 120
ggtgaagcgg ctggtgcccct cggcgccgat ctccgatctcg ttggagccct ggaggagcag 180
ggccttcttg aggttgccag tctgctgggt catgtaggcc acgctgttct tgcagtggta 240
ggtgatgttc tgggaggcct cgggtggacat caggcgcagg aaggtcagct ggatggccac 300
atcggcaggg tcggagccct ggccgccata ctggaactgg aatccatcgg tcatgctctc 360
gccgaaccgg acatgcctct tgccttggg gtctctgctg atgtaccagt tcttctgggc 420
cacactgggc tgagtggggt acacgcaggt ctccaccagt tccatgttgc agaagacttt 480
gatggcatcc aggttgccag cttgggtggg gtcaatccag tactctccac tcttccagtc 540
agagtggcac atcttg                               556

```

<210> 463

<211> 659

<212> DNA

<213> Homo sapiens

<400> 463

```

cacactgtgc ccttccagtt gctggccccg tacaagggcc tgaacctcac cgaggatacc 60
tacaagcccc ggatttacac ctgccccacc tggagtgcct ttgtgacaga cagttcctgg 120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggcccttggg caaatattct 180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtc ctccagact 240
ccacaacacc ccagcttcct cttccaggac aagagggtgt cctggteccct ggtctacctc 300
cccaccatcc agagctgctg gaactacggc ttctcctgct cctcggacga gtcctctgtc 360
ctgggcctca ccaagtctgg cggctcagat cgcaccattg cctacgaaaa caaagccctg 420
atgctctgcg aagggtctct cgtggcagac gtcaccgatt tcgagggctg gaaggctgcg 480
attcccagtg ccttgacac caacagctcg aagagcacct cctccttccc ctgcccggca 540
gggcacttca acggcttccg cagggtcac cgcctcttct acctgaccaa ctctcagggt 600
gtggactaga cggcgtggcc caagggtggt gagaaccgga gaaccccgag acgccctca 659

```

<210> 464

<211> 695

<212> DNA

<213> Homo sapiens

<400> 464

```

accttcattt gaccccatca gcttcagggc cttctttaca tttccactgg cctgatccat 60
gtatgcaatg ctatctttgc agtgatatgt gatgttctgg gaagctcggc tggagagaag 120
tcgaaggaat gccagctgca catcaaggac atcttcagga agttcaggat tgccgtagct 180
aaactgaaaa ccaccatcca tggactctcc aaaccaaacg tgtttcttct cagcactaga 240
atctgtccac cagtgtttcc gtggaacatt caaaggattg gcacttatgc atgtttcccc 300

```

```
agtttccata ttacagaata ccttgatagc atccaatttg catccttggc tagggccaac 360
ccagtattct ccaactcttga gttcaggatg gcagaatttc aggtctctgc agtttctagc 420
ggggttttta cgagaaccat caggactaat gaggctttct atttgtccat taacagactt 480
gagtgaagtc ataactctcat cggtgttgat ttgaaatcc attgggtcat ctccataata 540
cggggcaaaa ccgccagctt ttccacctcc aatcccagca atggcagcgg ctccaacacc 600
accacagcaa ggaccagggg caccaggagg tccaggaggg cctgggtgcc ctgggtggcc 660
tggggagccc tcagatctc ttccacctct gttac 695
```

<210> 465

<211> 73

<212> DNA

<213> Homo sapiens

<400> 465

```
caggtccaga gctcccaggt ttccagggtt cagtcctctc agtcccagag ctcccagggt 60
ttcgggtttcc agt 73
```

<210> 466

<211> 507

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 466

```
agcactggca gaggnagcca aatatagtga tgtgcgccag agataagtat tctcctctcc 60
aagcatattg ctatacaaga ctttaaagac ttcataaaaag ccaaacttgc agagtccttg 120
catggagtag ccaaggaaaag tcggagccca tcctttagcc aaaccacgaa caccatcctc 180
tttaagtgtg actgagaatc cgttaaatat gcccttgtag ttttgggggt ccacctgcat 240
acggcatttc actaaatcca ggggaaccac agcagtgtgt gtcagaccac aacttaagac 300
cccaccaaag ccacacagtg cataatactt cgcggagcca aattcacaac tgtactcttc 360
cacggcgggc gctgccaggt tgcgagggcg gcggggctgg cccgtgggcc ctggggagct 420
gctgcggagg tccccgagac catcgtgcac canctgcaga tgtggcgtgt tgaaggggtt 480
cgcccgcgcc aggtgcgccg cggaacga 507
```

<210> 467

<211> 183

<212> DNA

<213> Homo sapiens

<400> 467

```
cctcatgagc taccgggcca gctctgtact gaggtccacc gtctttgtag gggcctacac 60
cttctgagga gcaggaggga gccaccctcc ctgcagctac cctagctgag gagcctgttg 120
tgaggggcag aatgagaaaag gcaataaagg gagaaaagaa aaaaaaaaaa aaaagggcgg 180
ccg 183
```

<210> 468

<211> 129

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature
<222> (1)...(129)
<223> n = A,T,C or G

<400> 468
gcggccgcgt cgaccggcgc cgtcgggcnc cgggcccggc catggagctg tggacgtgtc 60
tggccgcggc gctgctgttg ntgntgctgn tgggtgcagtt gagccgcncn gccgagttct 120
acnccaang 129

<210> 469
<211> 243
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(243)
<223> n = A,T,C or G

<400> 469
gcggccgcgt cgacnngcca tggagactgt ggcacagtag actgtagtgt gaggctcgcg 60
ggggcagtggt ccatggaggc cgtgctgaac gagctgggtgt ctgtggagga cctgctgaag 120
tttgaagaaga aatttcagtc tgagaaggca gcaggctcgg tgtccaagag cacgcagttt 180
gagtacgcct ggtgcctggt gcggagcaag tacaatgatg acatccgtaa aggcacgtgt 240
ctg 243

<210> 470
<211> 452
<212> DNA
<213> Homo sapiens

<400> 470
cctcaagtac gtccggcctg gtggtgggtt cgagcccaac ttcattgctct tcgagaagtg 60
cgagggtgaac ggtgcggggg cgcaccctct cttcgccctc ctgcccggagg ccctgccagc 120
tcccagcgac gacgccaccg cgcttatgac cgaccccaag ctcattcacct ggtctccggt 180
gtgtcgcaac gatgttgctt ggaactttga gaagtctctg gtgggcccctg acggtgtgcc 240
cctacgcagg tacagccgcc gcttccagac cattgacatc gagcctgaca tcgaagccct 300
gctgtctcaa gggctcagct gtgcctaggg cggccctcct accccggctg cttggcagtt 360
gcagtgtctg tgtctcgggg gggttttcat ctatgagggt gtttctctta aarctacgag 420
ggaggaacac ctgatcttac agaaaatacc ac 452

<210> 471
<211> 168
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(168)
<223> n = A,T,C or G

<400> 471
cttctccgct cttctetanga tctccgcctg gttcggncgg cctgcctcca ctcctgcctc 60
taccatgtcc atcaggggtga cccagaagtc ctacaagggtg tccacctctg gcccccgggc 120
cttcagcagc cgctcttaca cgagtggggc cgggtcccgcc atcagctc 168

<210> 472
<211> 479
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(479)
<223> n = A,T,C or G

<400> 472
gccaggcgctc cctctgtctg cccactcagt ggcaacaccc gggagctggg ttgtcctttg 60
tggagcctca ncagttccct ctttcanaac tcaactgccaa gagccctgaa caggagccac 120
catgcagtgct ttcagcttca ttaagaccat gatgatcctc ttcaatttgc tcatctttct 180
gngtggcgca gccctgttgg cagcgggcat ctgggtgnca atcgatgggg catcctttct 240
gaagatcttc gggccactgt cgtccactgc catgcagttt gtcaacgngg gctacttcct 300
catcgcagcc ggcgttggg tntttgctct tggtttcctg ggctgctatg gtgctaana 360
tgagagcaag tgtgccctcg tgacgntctt cttcactctc ctctctctct tcattgctga 420
ggntgcagnt gctgaggtcc gccttggtgt acaccacaat ggctgagccc ttncctga 479

<210> 473
<211> 69
<212> DNA
<213> Homo sapiens

<400> 473
gagcgatgga gcgtgggtag ggaggggtcca cagtgtccac tcgccgtgtg cgaagggttga 60
ctcggtagt 69

<210> 474
<211> 155
<212> DNA
<213> Homo sapiens

<400> 474
gccgccactg ccgggagagc tcgatgggct tctcctgcgc gccgcccggg gtctggccga 60
gtccagagag ccgcggcgcc tcgttccgag gagccatcgc cgaagcccga ggccgggtcc 120
cgggttgggg actgcagggg aaggcagcgg tggcg 155

<210> 475
<211> 282
<212> DNA
<213> Homo sapiens

<400> 475
ggcttcgacg ttggccctgt ctgcttcctg taaactccct ccatacccaac ctggctccct 60
cccacccaac caactttccc ccraaccggg aaacagacaa gcaacccaaa ctgaaccccc 120
tcaaaagcca aaaaatggga gacaatttca catggacttt ggaaaatatt tttttccttt 180
gcattcatct ctcaaactta gtttttatct ttgaccaacc gaacatgacc aaaaacccaaa 240
agtgcattca accttacaa aaaaaaaaaa aaagggcggc cg 282

<210> 476
<211> 434
<212> DNA

<213> Homo sapiens

<400> 476

```
ctccaggaca gcgtccagct tgggtgctgtt gaagacgaag tggagcggat ggttgtagaa 60
acgagtgatg gtgctgagcg gcgtgcagtc ttctgggatcc acgaaggcca agtccttgag 120
gtagagcatg tccacgatgt tggagcgctc ctctctgtac accgggatgc gcgtgtggcc 180
gctctgcatg atgctggcca ggacgccgaa gtccagcacg gtgctggcgt ccagcatgaa 240
gcagtcttcg aggggcgtga gcacgtcctc cacgggtccg cagcgcagca cgccttgct 300
gagatcgctg taggggtcgc cgccgccgcg cgccagctcc agcaccgcgt cccgcagccg 360
cccgggccgc gccgccagct ccagcagctg cccacgggc agcgcgacgg gcagagtga 420
caggacggcc aggc 434
```

<210> 477

<211> 314

<212> DNA

<213> Homo sapiens

<400> 477

```
ggcgggcgct agctggctcc gggcagctcg gccttggggg ctctggggcc ccgagacgcg 60
gggcgtatga gtggggcgct cgctccacgc ggaagtcgga gcctcctccc ctggataggg 120
tgtacgagat ccctggactg gagcccatca cctttgcggg gaagatgcac ttctgtgccct 180
ggctggcgcg gccgatcttt ccgccttggg accgcggcta caaggacca aggttctacc 240
gctcgcctcc tcttcacgag catccgctgt acaaagacca ggcttgcctat atctttcacn 300
accgttgccg cctt 314
```

<210> 478

<211> 317

<212> DNA

<213> Homo sapiens

<400> 478

```
aacagagtga tcattccagt taagcggggc gaagagaata cagactatgt gaacgcctcc 60
tttattgatg gctaccggca gaaggactcc tatatcgcca gccagggccc tcttctccac 120
acaattgagg acttctggcg aatgatctgg gagtggaaat cctgctctat cgtgatgcta 180
acagaactgg aggagagagg ccaggagaag tgtgcccagt actggccatc tgatggactg 240
gtgtcctatg gagatattac agtggaactg aagaaggagg aggaatgtga gagctacacc 300
gtccgagacc tcttggt 317
```

<210> 479

<211> 171

<212> DNA

<213> Homo sapiens

<400> 479

```
aggtgctttg ctagatgctg tgacaggtat gccaccaaca ctgctcacag cctttctgag 60
gacaccagtg aaagaagcca cagctcttct tggcgtatct atactcactg agtcttaact 120
tttcaccagg ggtgctcac cctgccccta ttgggagagg tcataaaatg t 171
```

<210> 480

<211> 65

<212> DNA

<213> Homo sapiens

<400> 480

```
ccccagtgg aaggctccca ccctggtaga tgaacagccc ctggagaact acctggatat 60
```

ggagt

65

<210> 481

<211> 207

<212> DNA

<213> Homo sapiens

<400> 481

```
cacagcgtgc tctgcggggg cactcccact ttgttagtga tgtgggttacc tcctcagatg 60
gccagtttgc cctctcaggc tcctgggatg gaaccctgcg cctctgggat ctccacaacgg 120
gcaccaccac gaggcgattt gtgggccata ccaaggatgt gctgagtgtg gcctttctcct 180
ctgacaaccg gcagattgtc tctggat 207
```

<210> 482

<211> 319

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(319)

<223> n = A,T,C or G

<400> 482

```
cacactgtgc ccttcagtt gctggcccgg taaaaaggcc tgaacctcac cgaggatacc 60
tacaagcccc ggatttacac ctgcctacc tggagtgcct ttgtgacaga cagttcctgg 120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggcttttgtt caaatattct 180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtg cttccaaaact 240
gcacaacacc cnagcttctt cttccagnac aagaggggtg cctggtcctt ggctacctc 300
cccaccatcc agagctgct 319
```

<210> 483

<211> 233

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(279)

<223> n = A,T,C or G

<400> 483

```
acaggccccg tggcgccctag ccttcagctg ctgggctctc ccgagcctgc cttagcccat 60
acaaccactt gatcacgcgg gcattgcgct ccaccaccga cacgccatag ggaacgcgct 120
cccgggcccc ctccctcaaca gtcaccgagc tgcggcgagg gcagccccct tcagagctgc 180
ccggccccagc actgggccct gccagggaca cnatatccga gctggccctg gcc 233
```

<210> 484

<211> 194

<212> DNA

<213> Homo sapiens

<400> 484

```
agagcccttg ctgggggggt cctgggagat ggggtaagaa gagctttcat ttgtctggta 60
gatagatagc atgtaagggg gtggttgtcc caggaggcag ctgctgacag gtttgctaca 120
```


cacagccccg gactgtgttg cctgggtgct cattcagaga ggggctatca tctgggagcc 180
tgtgcccctg ggtc 194

<210> 485

<211> 67

<212> DNA

<213> Homo sapiens

<400> 485

tccatatcca ggtagttctc caggggctgt tcatttacca ggggtgggagc ctcccactgg 60
gggaagt 67

<210> 486

<211> 70

<212> DNA

<213> Homo sapiens

<400> 486

taccgagtca accttcgcac acggcgagtg gacactgtgg accctcccta cccacgctcc 60
atcgctcagt 70